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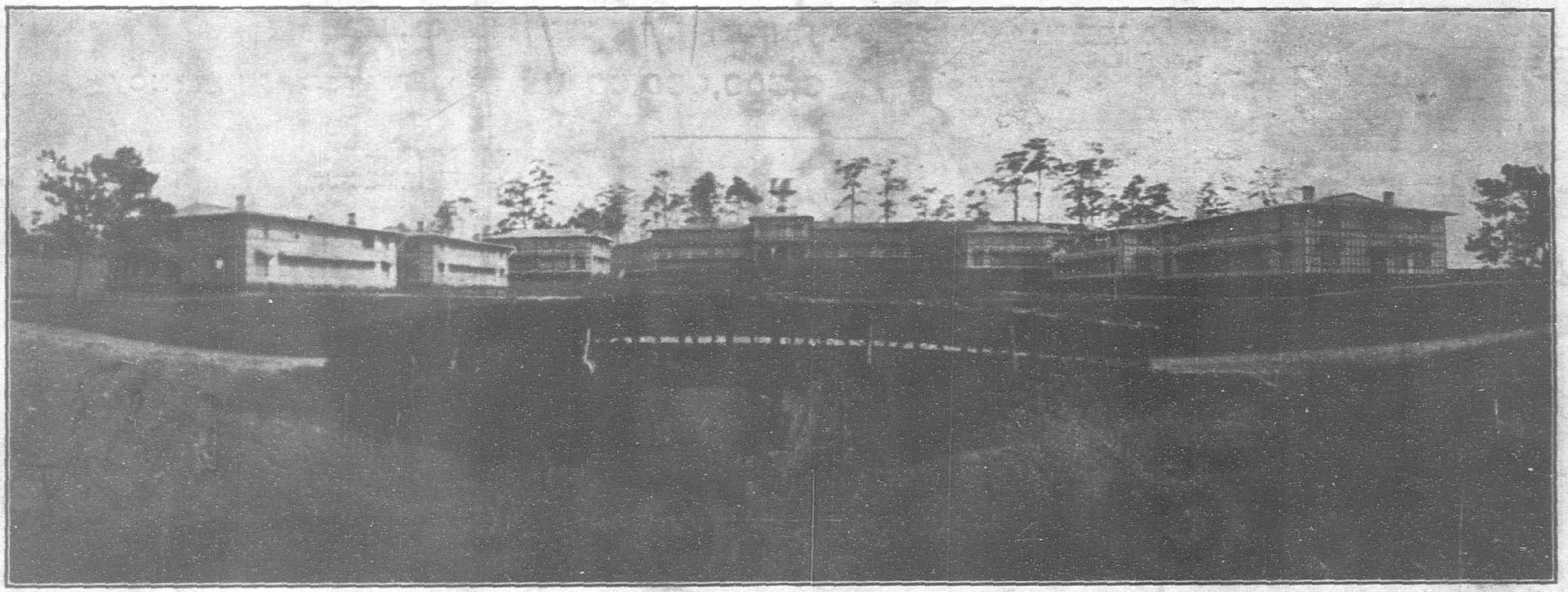
THE FAR EASTERN REVIEW

VOL. VIII.—No. 1. MANILA AND SHANGHAI, JUNE, 1911. 25 cents, U. S. Cy.

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS

BAGUIO, THE SIMLA OF THE PHILIPPINE ISLANDS

THE PHILIPPINE ALPS—VIEW OF THE ZIGZAG ON THE BENGUET ROAD.



GOVERNMENT CENTER AT BAGUIO.

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Hongkong and Shanghai Banking Corporation

DEPOSITORY OF THE GOVERNMENT OF THE PHILIPPINE ISLANDS

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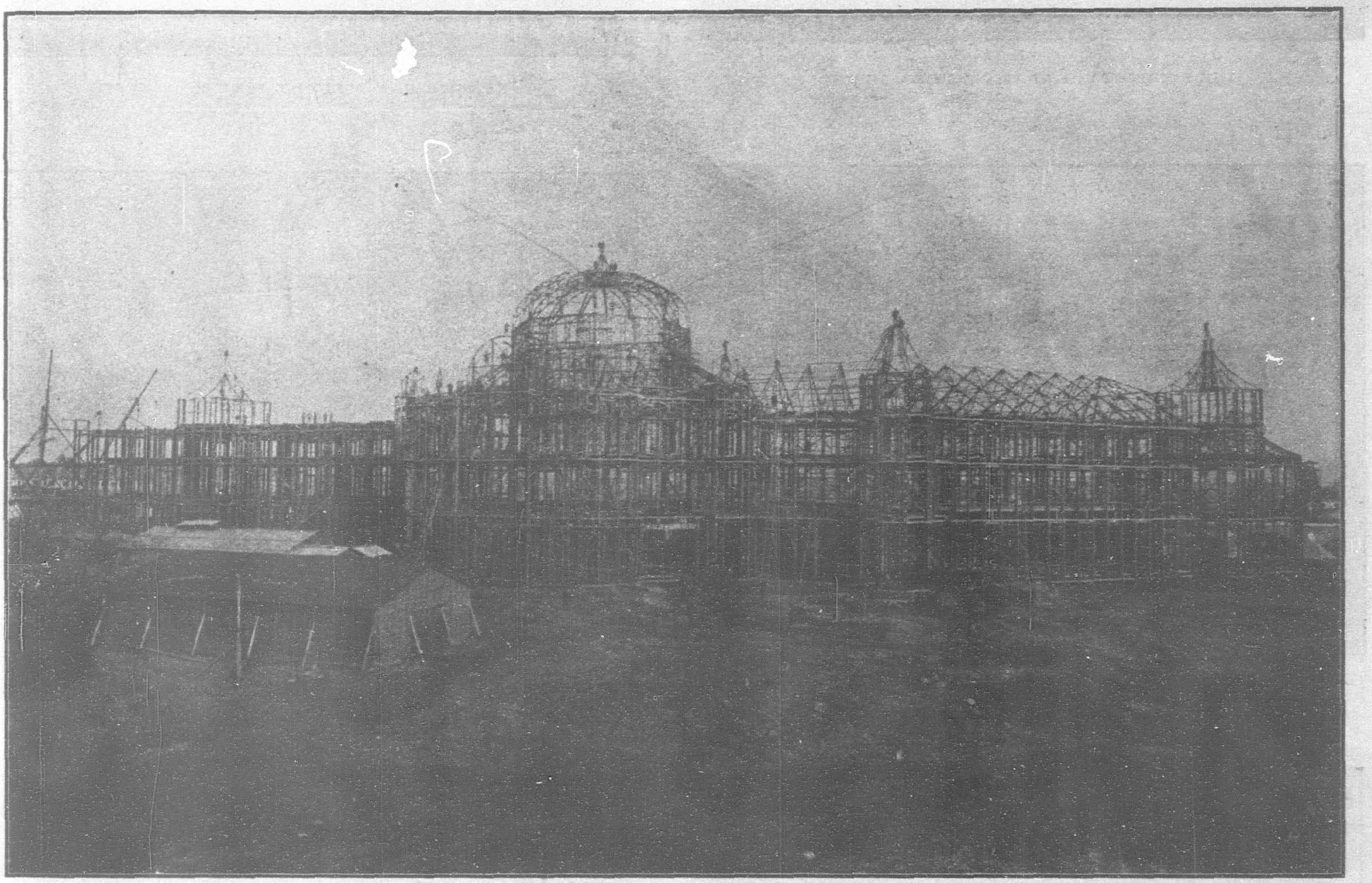
THE FAR EASTERN REVIEW
COMMERCE ◆ ENGINEERING ◆ FINANCE

VOL. VIII. MANILA, P. I., SHANGHAI, AND YOKOHAMA, JUNE, 1911 No. 1.

THE ISLAND EMPIRE OF THE PACIFIC AND HER RAILWAYS

JAPAN, A CENTRE IN INTERNATIONAL COMMUNICATION



GRAND CENTRAL RAILWAY STATION AT TOKIO.—STEEL FRAMEWORK, FEBRUARY, 1911

Since Japan is situated in the Northeastern part of Asia, directly opposite the United States of America across the Pacific in the East, and with the Maritime Province of Russia beyond the Japan Sea on the Northeast, and Hongkong and Shanghai in the South, the two centres of Chinese foreign commerce; all mail ships sailing to and from South America, the United States and Canada, with Hongkong as their port of call and their starting point, make it a rule to stop at Kobe and Yokohama, and also all steamship lines extending from the Far East to India, Australia and Europe start from either Kobe or Yokohama.

Japan is excellently situated in the eastern center of world travel, and is to the Pacific what Great Britain is to the Atlantic—the focus towards which trade and tourist routes converge, to again diverge as widely. Here travelers from America and Australia to China or India and other lands of the Orient, or those journeying further Westward to Europe or travelers on their way from Europe all find it pleasant and convenient to break the monotony of the sea voyage by a visit to Japan which thus becomes, as it were, the aesthetic refreshment room for those undertaking international journeys, supplying all the needs of lovers of the fascinating and picturesque, and it is the Imperial Government Railways that render it possible to visit the many picturesque spots which have become far famed for their antiquities, art and history; the passenger is carried through marvellous and wonderful characteristic scenery, and is enabled to observe the chief points of interest in the leading cities of Japan, with unusually convenient points of departure from the following noted places, viz., Tsuruga for Vladivostok and the Trans-Siberian Route; Kobe, Shimonoseki, Nagasaki, etc., for the China Coast or long sea route to Europe; Yokohama, Kobe, etc., for Canada, the United States and Australia. It is, therefore, most convenient for tourists from either Europe or America to come first to Japan and here to plant their journeys in all directions.

TRAVELING ROUTES BETWEEN JAPAN AND WESTERN EUROPE

Japan, the eastern focus of world-travel and England, the western centre of international communication, and connected by three principal travelling routes, viz., via Suez, via America, and via Siberia.

On the Suez route there are in service the English P. & O. Steam Navigation Company, Nippon Yusen Kaisha, French Messageries Maritimes, German Lloyd Steamship Company, Austrian Lloyd Steamship Company, etc. After crossing Europe, those wishing to journey by one of these lines will embark

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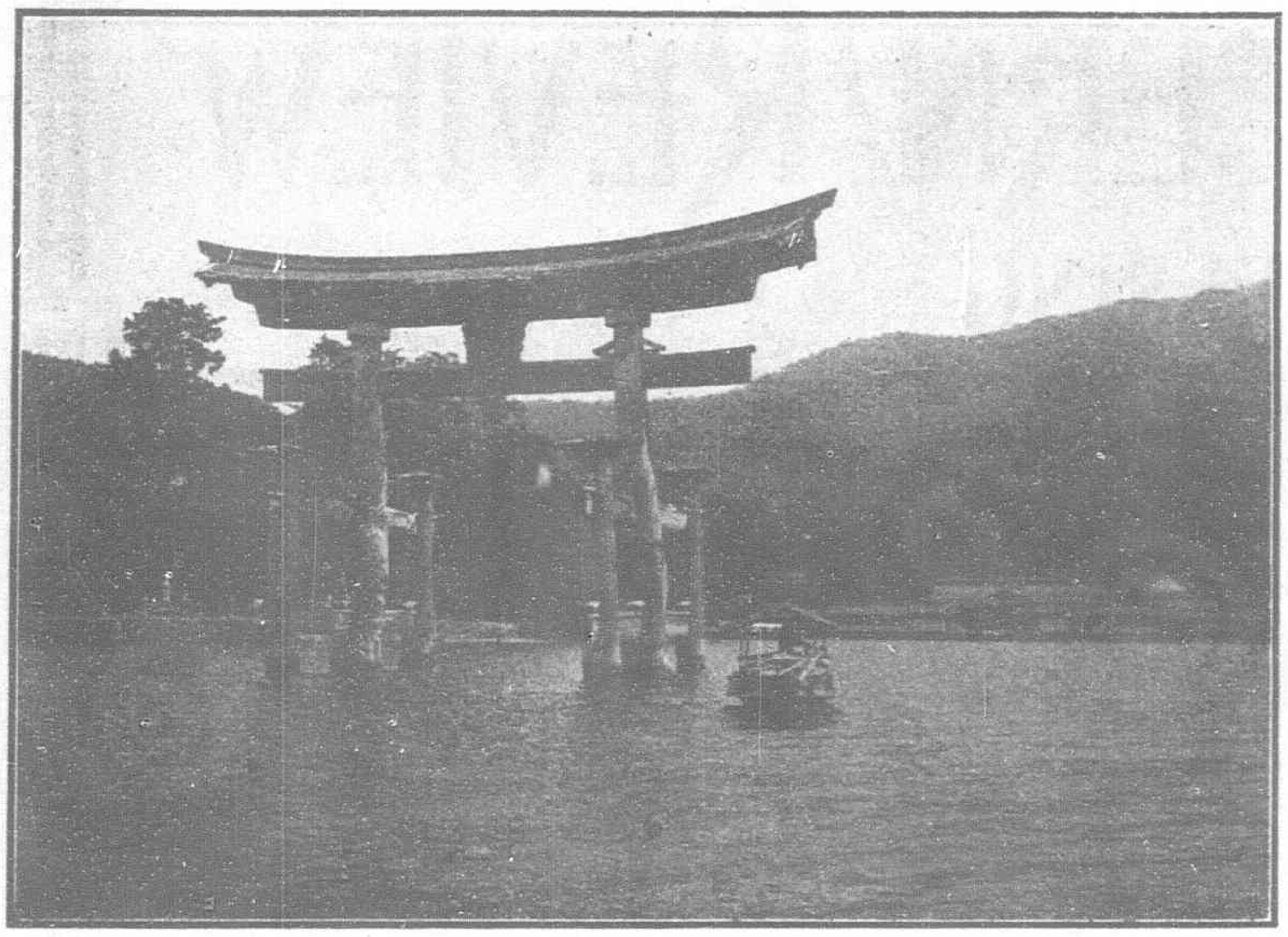
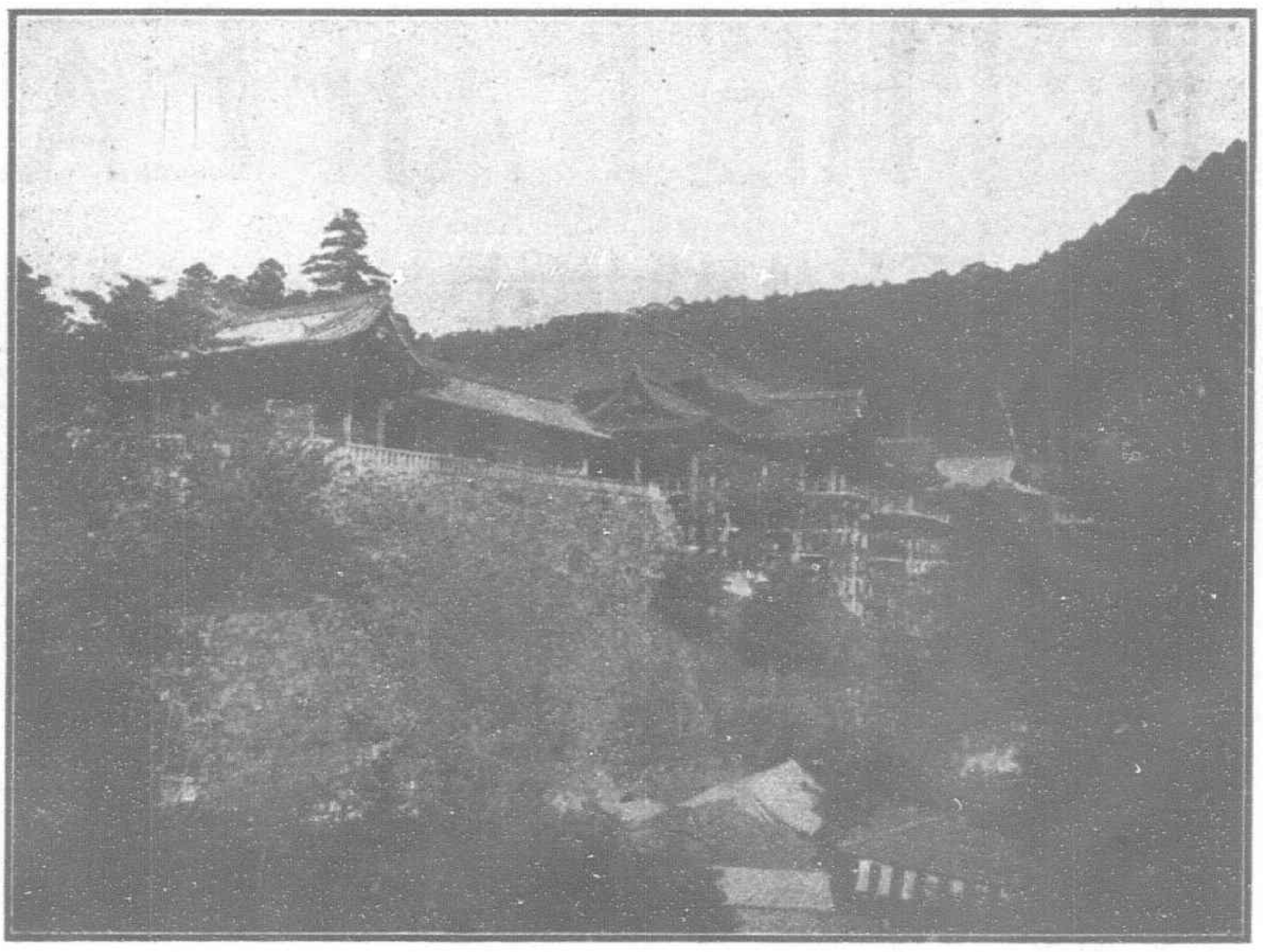
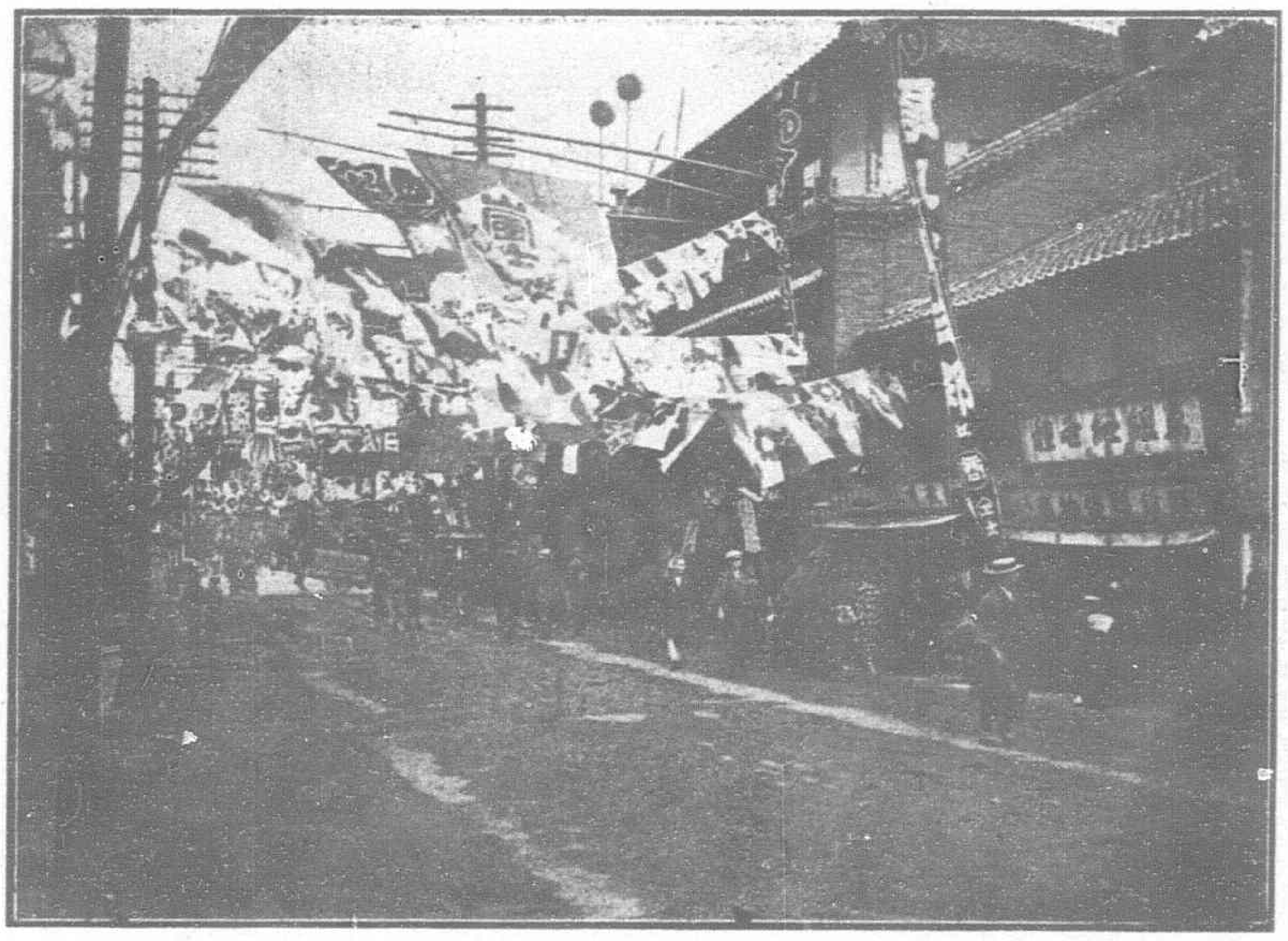


THE SACRED TORII AT ITSUKUSHIMA SHRINE

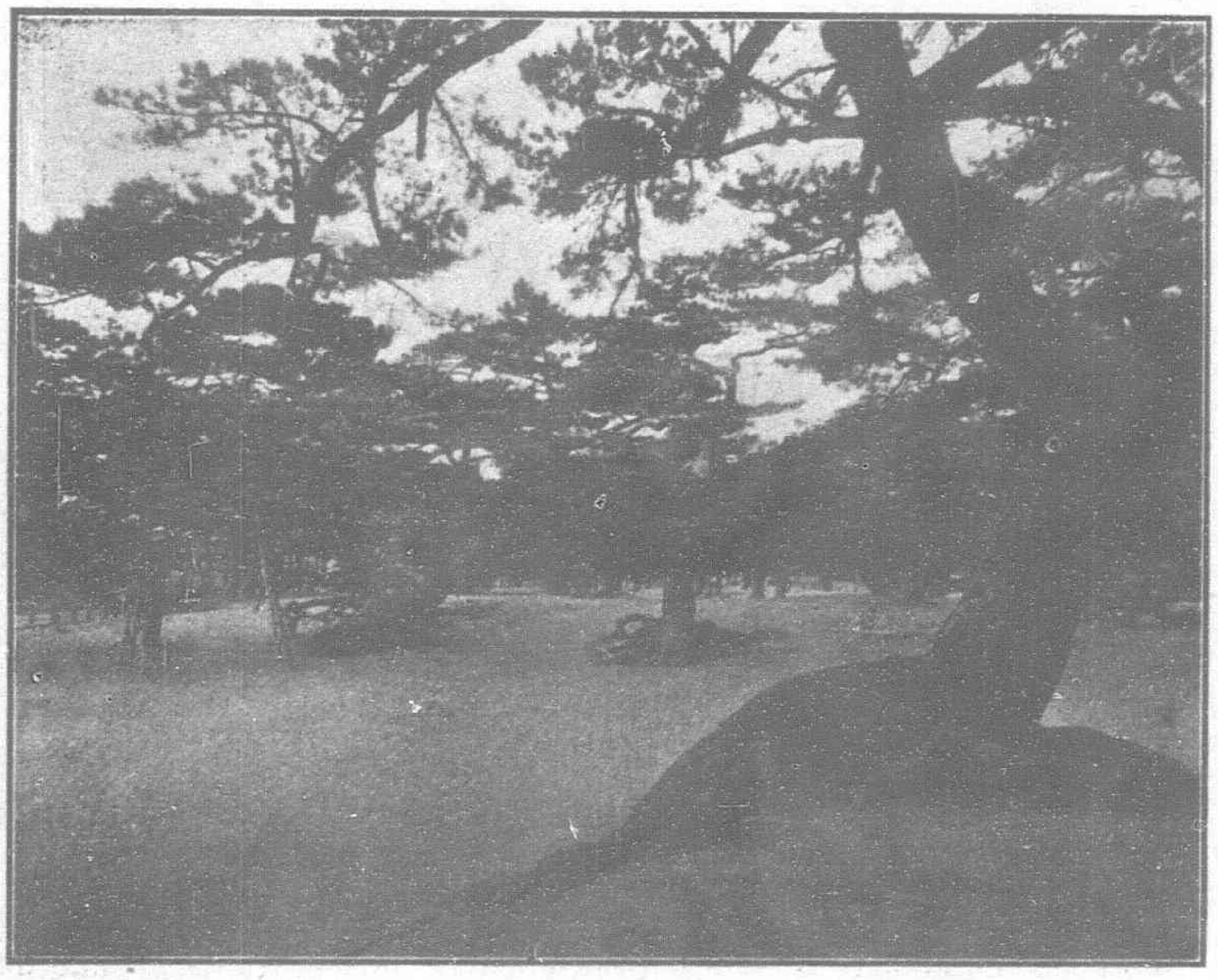


KIYOMIDZU, A BUDDHIST TEMPLE, IN KYOTO

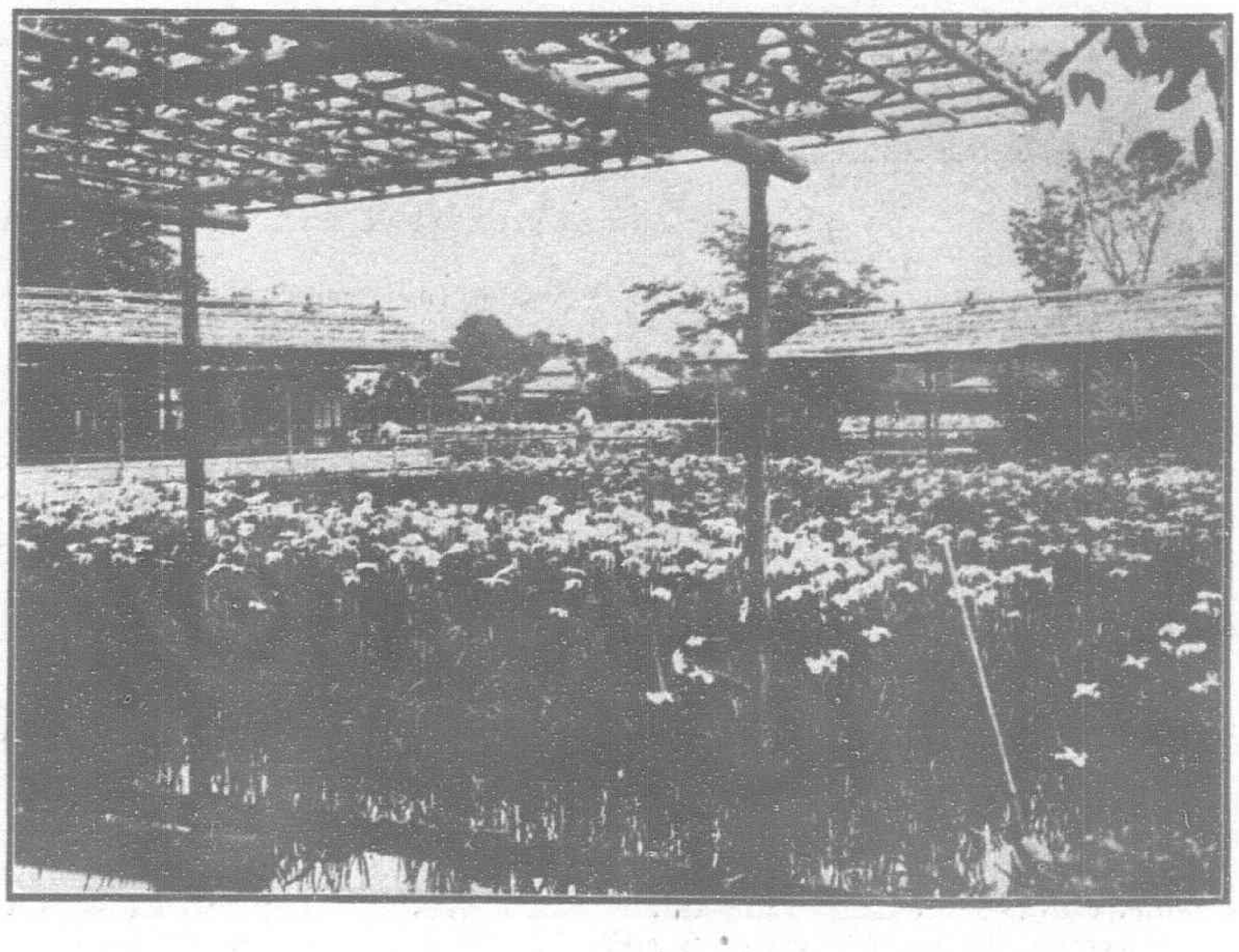


DOTOMBORI, AN AMUSEMENT QUARTER IN OSAKA

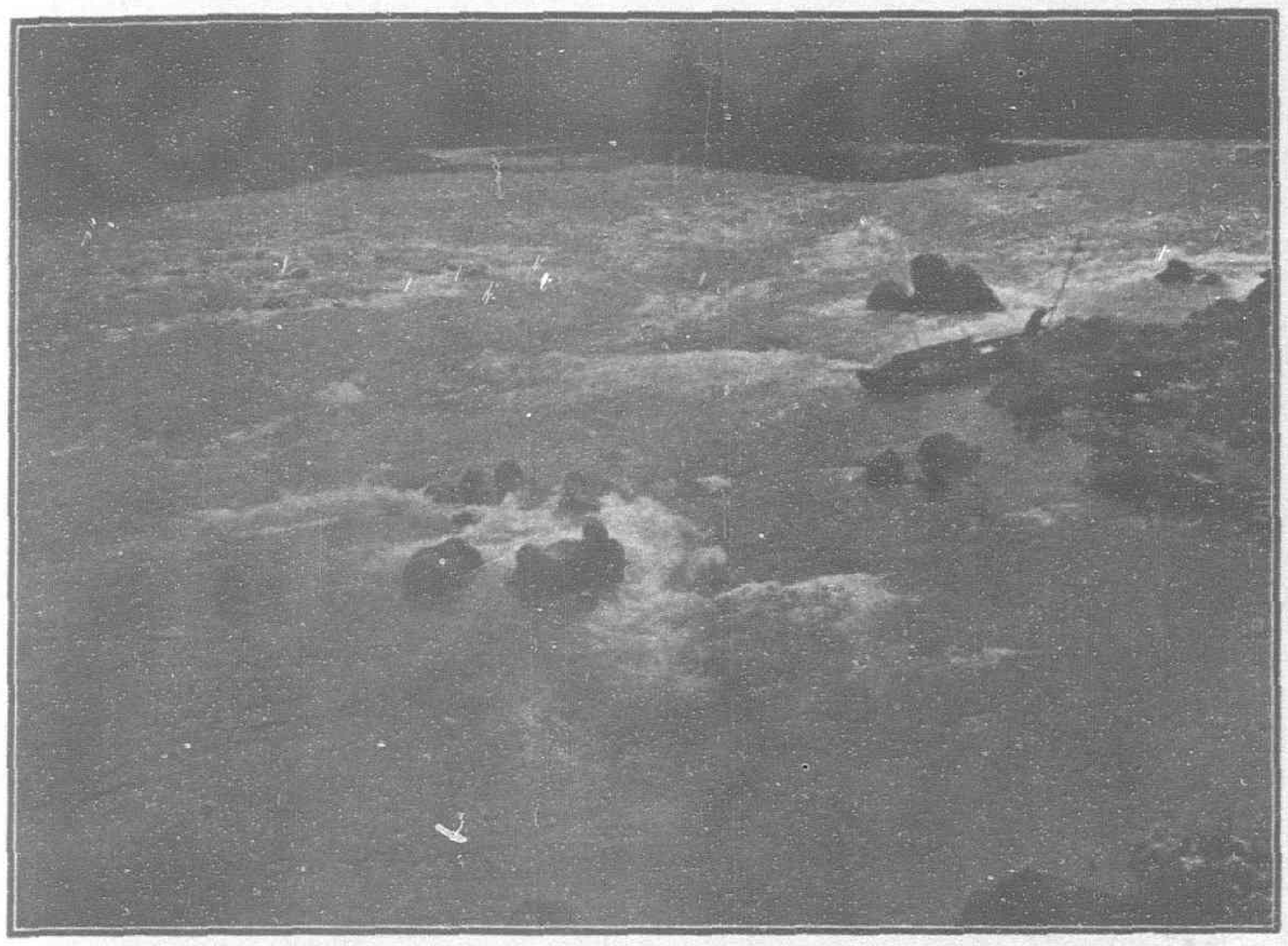
A CHRYSANTHEMUM GARDEN

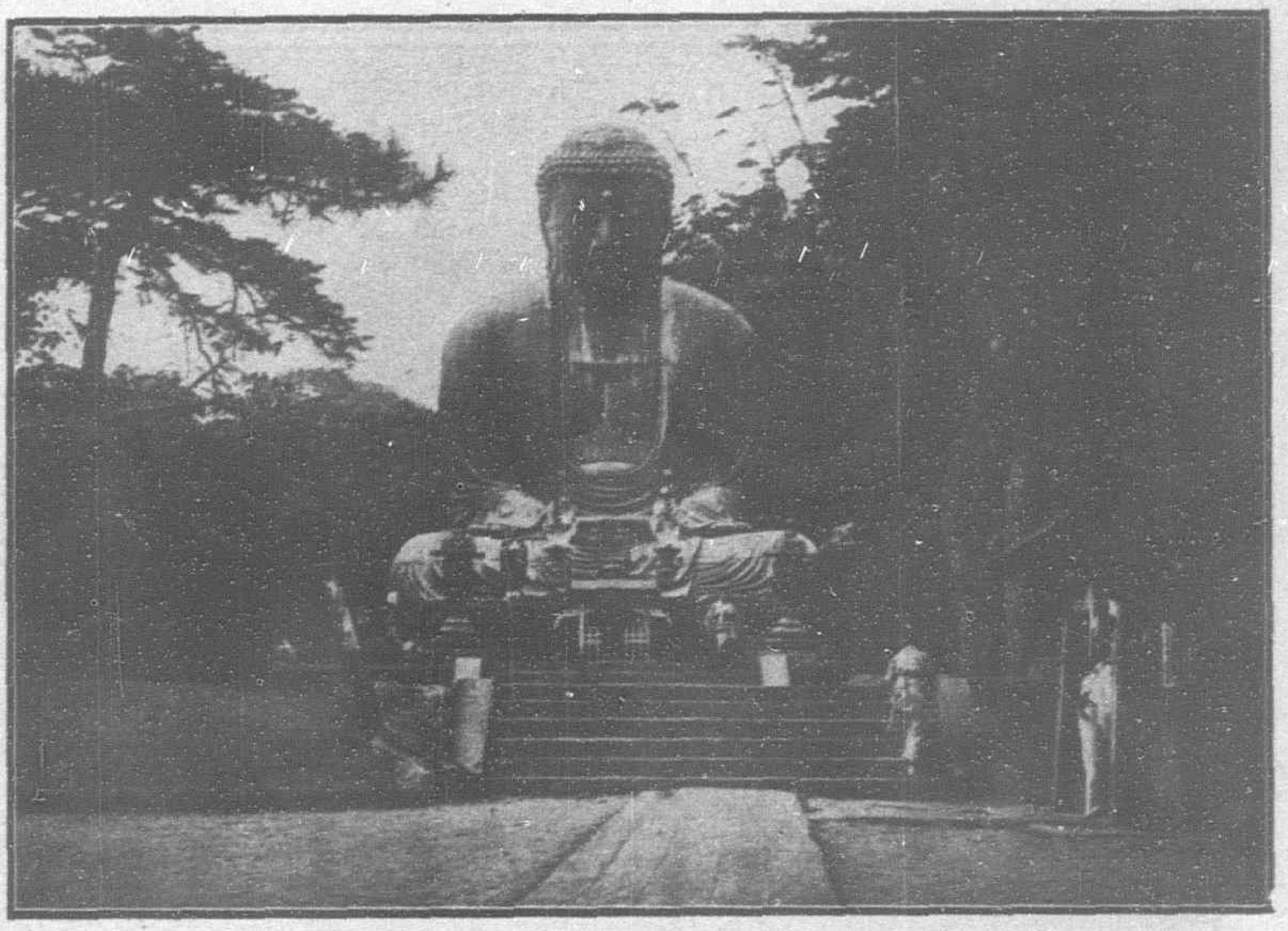


MAIKO PARK



AN IRIS GARDEN NEAR TOKYO


RAPIDS ON THE KUMA RIVER, KYUSHU


DAIBUTSU, THE HUGE BRONZE IMAGE OF BUDDHA, AT KAMAKURA

at Brindisi, Marseilles, Naples, or Trieste, and will reach Tokyo in five or six weeks after their departure from London with a difference of a few days only according to the steamer.

Those following the American route will cross the Atlantic to the United States or Canada by quick liners such as the Cunard, the White Star, American Steamship Company, French Trans-Atlantic, Canadian Pacific Mail, German Lloyd, or Hamburg American lines; and after traveling by one of the Trans-continental railway lines to the Pacific coast, will voyage across the Pacific to Japan by any of the following steamship lines; Nippon Yusen Kaisha, Toyo Kisen Kaisha, Osaka Shosen Kaisha, Pacific Mail, Canadian Pacific, or Great Northern Steamship Company. By the shortest route which lies in this direction, the journey from the capital of the Island Empire of the Atlantic to the capital of the Island Empire of the Pacific, can be accomplished in less than four weeks.

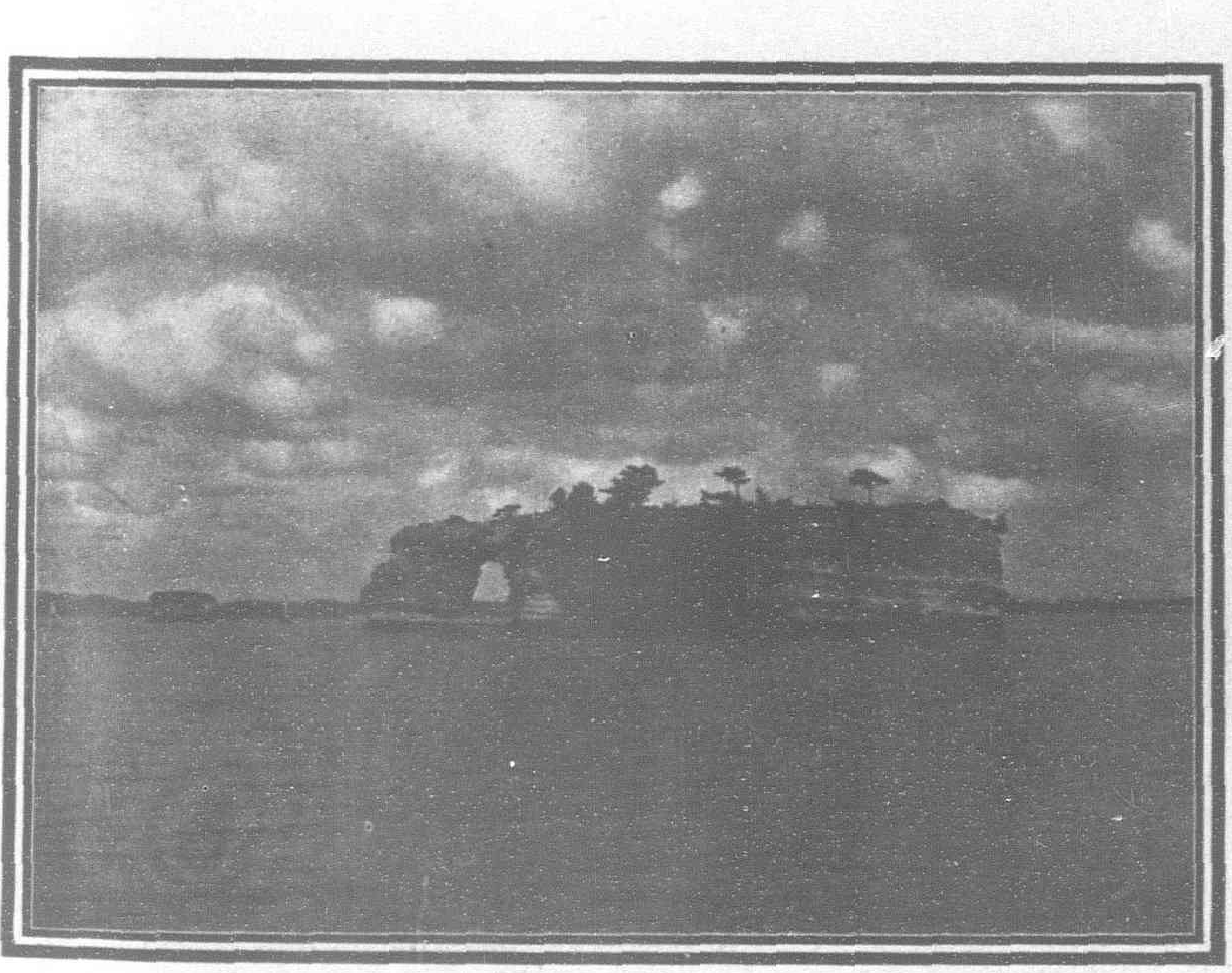
Lastly there is the Trans-Siberian route, which has been drawn to the attention of the world, as the shortest of all the routes between Western Europe and Eastern Asia, and is destined to be the principal highway in this quarter of world-travel. By this route, the time required for the journey between London and Tokyo, and between Berlin and Tokyo has been shortened to 16 and 15 days respectively. As the whole length of this route, more than 8,000 miles, is covered by rail except at the English Channel and a 40 hours' voyage of about 480 miles between Vladivostok and Tsuruga, it is, from point of safety and regularity, beyond comparison with other routes.

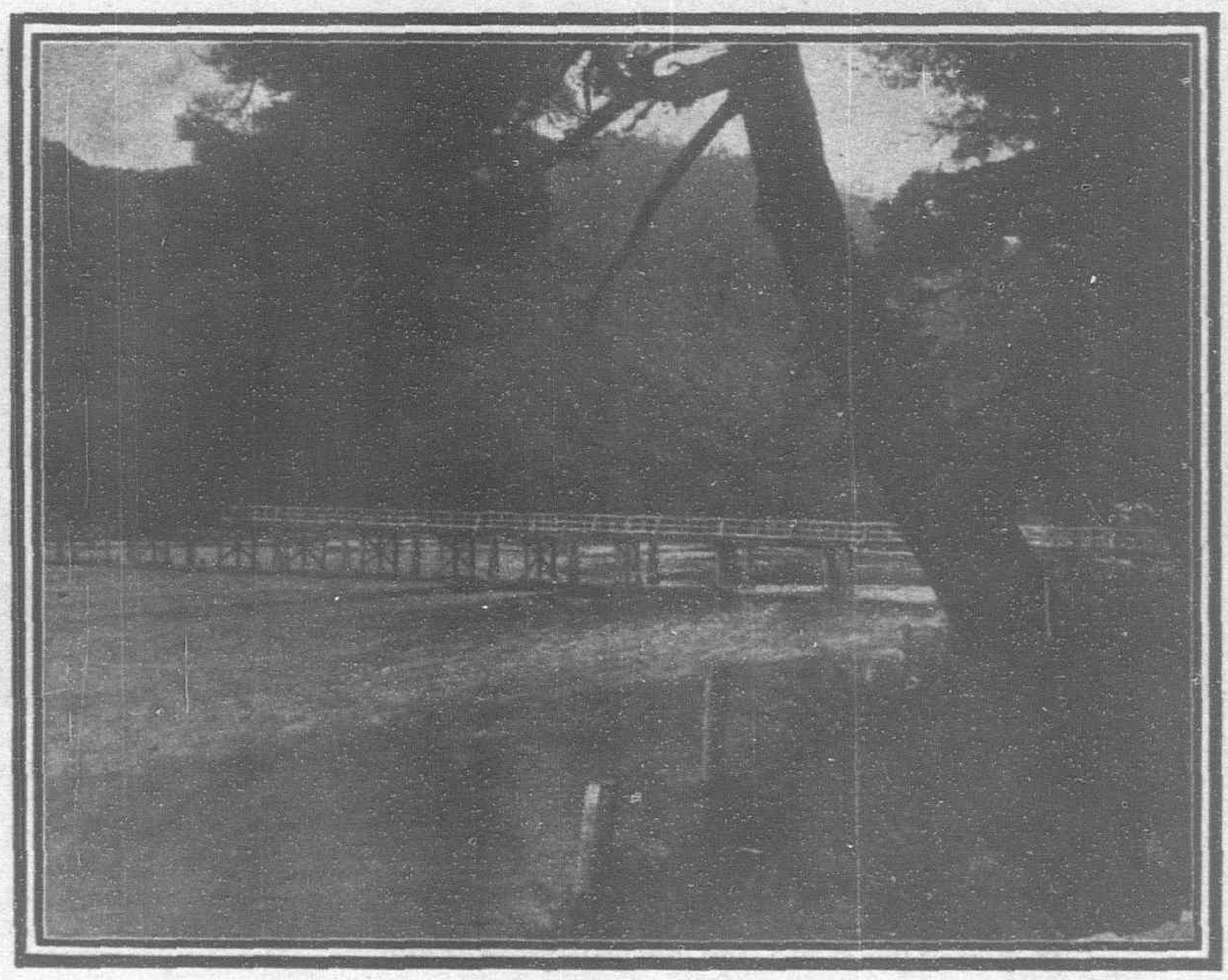
The public, traveling from London to Tokyo by the Trans-Siberian route, must not forget the existence of a short cut turning to the right at Harbin, on the Chinese Eastern Railway. This line branches off at Harbin, toward the South, and runs down to Changchun, where the famous express trains of the South Manchuria Railway wait to carry passengers to Dairen. The steamers of the Japanese Osaka Shosen Kaisha, which connect with this express at Dairen, voyage across to Shimonoseki, the western threshold of Japan, and from this point travelers may make the journey to Tokyo, a distance of 700 miles, in two days and nights, enjoying on the way the picturesque scenery of the Seto Inland Sea, from the carriage windows, stopping at Kobe, the greatest open port in West Japan; Osaka, the entre of industry; and Kyoto, a place of historic interest.

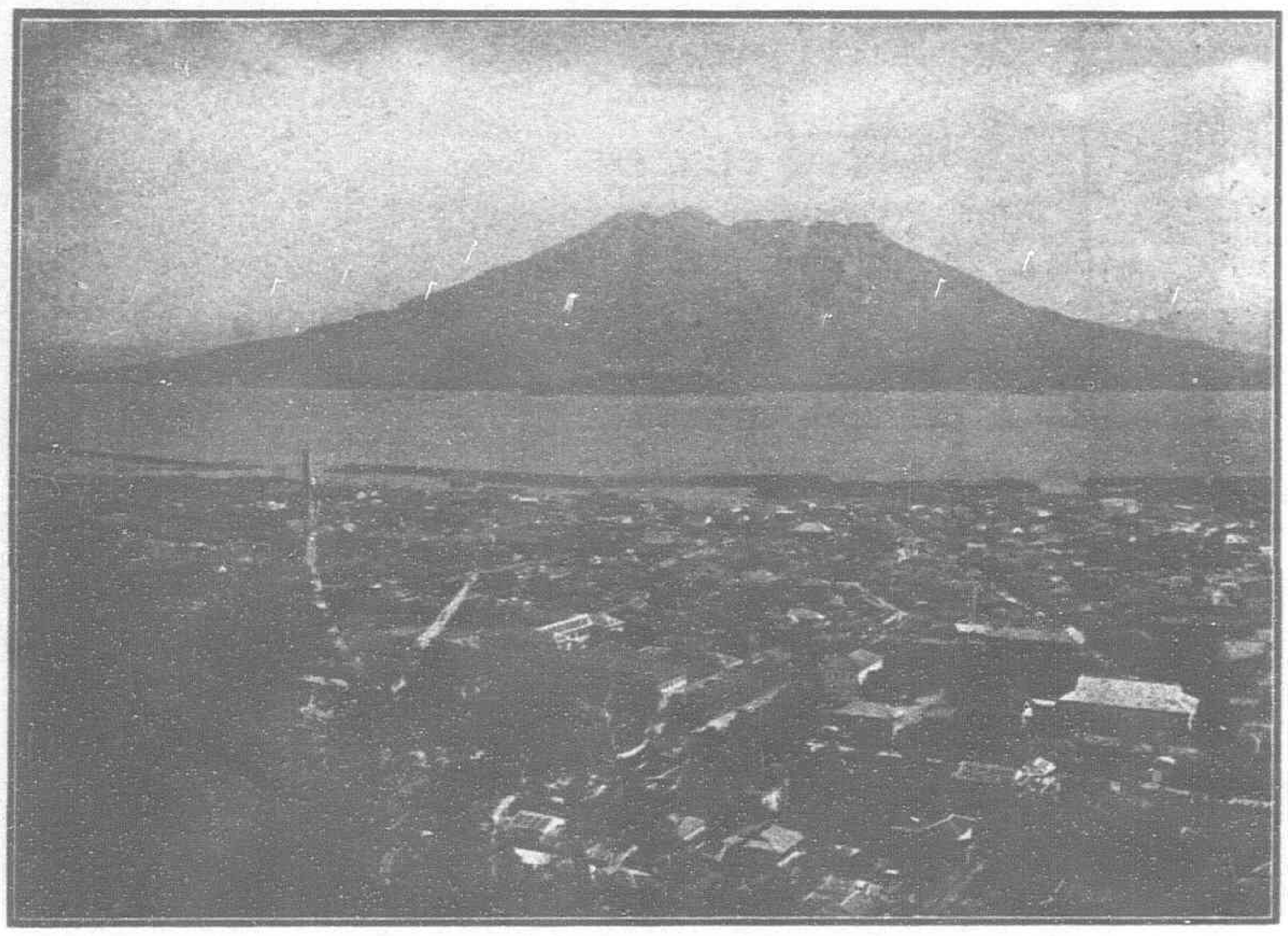
When the reconstruction of the light railway line of 189 miles from Mukden to Antung is completed, and the long bridge over the Yalu River is finished, the Korean Railway line extending over 585 miles from Shingishu to Fusan, and the connecting service of superb steamers under the control of the Imperial Government Railways between Fusan and Shimonoseki, will make it possible to accomplish the trip from Mukden to Tokyo, via Shingishu, Fusan and Shimonoseki. in 16 hours or so. Moreover, in case quicker steamers be placed on the service between Fusan and Shimonoseki, the voyage of 120 miles will be covered in a very few hours. It will be, therefore, most convenient for travelers between Western Europe and Eastern Asia to follow this route via Fusan, which will consequently become the most important route of world-travel.

NATURAL FEATURES AND CLIMATE OF JAPAN

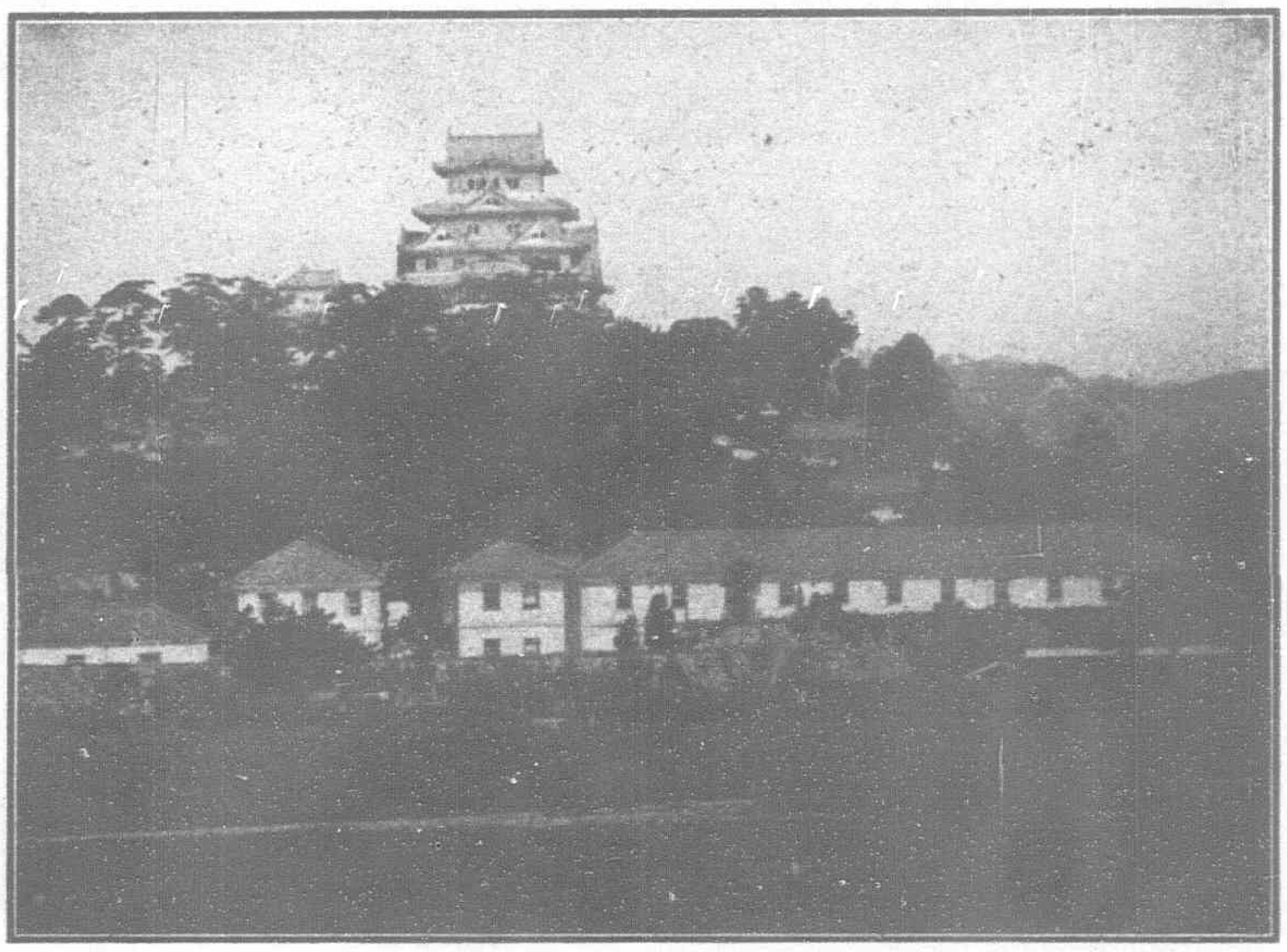
In regard to the climate and natural features of the country, we call attention to the fact that, with Hondo as the centre island, Japan stretches itself northward to Hokkaido, Kabafuto (Saghalin) and still further to Chishima (Kurile Islands) which is very near the frigid zone, and southward to Shikoku, Kyusyu, Ryukyu (Loo-choo) Islands and further to Taiwan (Formosa) which lies in the torrid zone. Consequently we have great variety of climate from cold, temperate, to a gradual change into a tropical zone; charmed at all points with marvelous beauty of natural scenery. These islands are generally mountainous and volcanic. In the middle of Hondo two great mountain ranges meet, one extending from Kabafuto and the other from Taiwan originating in China, and forming a watershed which divides Hondo


A WATER WORN ARCH, KNOWN AS "LUMBER-ROCK," AT MATSUSHIMA BAY


ARASHIYAMA, NEAR KYOTO



SAKURAJIMA, AN ISLAND IN FRONT OF KAGOSHIMA CITY, KYUSHU

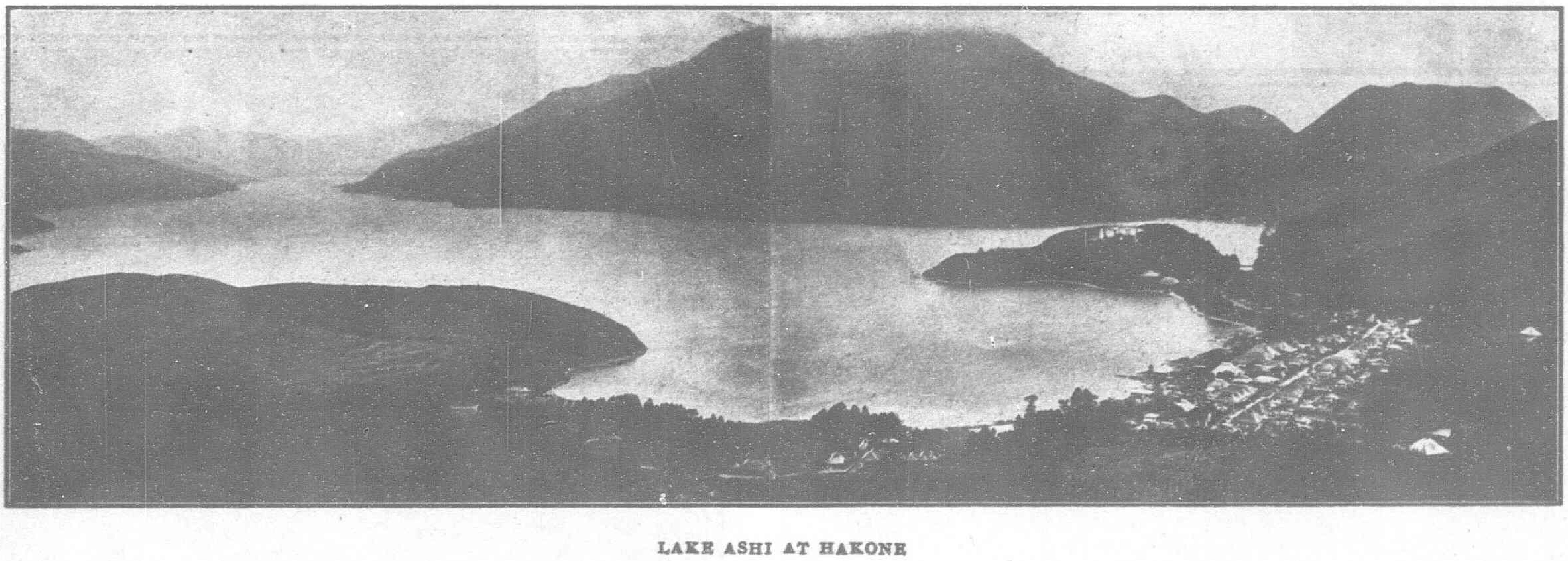


FEUDAL CASTLE AT HIMEJI

into South Japan and North Japan. At this junction of mountain ranges many lofty mountains tower high among the clouds and the highest of them all is Mount Fuji, known so well the world over for its beauty of outline. The most celebrated active volcanoes are Nasudake, Bantaizan, and Asamayama in Hondo; Noboribetsudake in Hokkaido; and Kirishimayama and Asozan in Kyushu.

Owing to the existence of volcanoes, there are many places where carburetted or sulphurous hot springs are to be found which are excellent health resorts throughout the year. The most famous of these are Hakone, Arima, Atami, and Ikao.

The climate of Japan is generally mild and healthy but the best seasons are April and May in the spring, and October and November in the autumn. In spring the cherry blossoms beautify the landscape and other flowers of various kinds vie with each other in loveliness. Autumn brings forth the famous chrysanthemums and maples. From the end of January until the beginning of March, the weather is cold except in Atami, Dogo, and other hot spring resorts; in the northeastern district snow often falls several feet deep, but in the region southward from the middle of Hondo, it is warm even in the middle of winter, making traveling and a sojourn there during the winter months one of intense delight and of value to the health, especially to those of delicate constitutions. July and August are the hottest months and the season for heavy rains but there are many places such as Karuizawa, Nikko, Hakone, and other summer resorts which lie scattered throughout the country where the climate is enjoyable and pleasant.



LAKE ASHI AT HAKONE

Towards the close of spring, the winds are high; June is usually a wet season known as "Baiu"; and September is also at times rainy. The air is very dry in December. Therefore, the best season to visit Japan is spring and autumn.

With regard to the city of Tokyo, the capital of Japan, it stands on a large plain known from ancient times as Musashino, facing the bay of Tokyo, which gives it refreshing winds at all times of the year. It is pierced with canals and on account of its gradual rising ground has a great and natural drainage which empties into the sea. There are several popular resorts located in the neighbourhood of the capital such as Kamakura, Oiso, Odawara, Atami, Hakone, etc., where in a few hours people can escape from the bustle and heat of the metropolis during the winter and summer months.

THE SYSTEM OF THE GOVERNMENT RAILWAYS OF JAPAN

The total length of railway lines in Japan is now more than 5,000 miles and the extension of the railway system has contributed not a little to the social and material progress of Japan. The development of the railways will be the sole aim of the authorities who have used all their efforts for the improvement of the railways, since the nationalization of the principal railway lines in Japan. The general system of railway lines under the Government control is as follows:—

A trunk line which starts from Aomori in the extreme north of Hondo and which is connected with Hokkaido by three beautiful steamers named Tamuramaru, Hirafumaru, and Umegakamaru, leads to Tokyo via Sendai along the eastern coast, and from Tokyo another trunk line extends to Shimonoseki southward, the southern extremity of Hondo, passing the principal cities, such as Yokohama, Nagoya, Kyoto, Osaka, Kobe, Okayama, Hiroshima, etc. The total mileage of these trunk lines from Aomori to Shimonoseki is 1200 miles and many branch lines issue from them in various directions, forming a network of railway lines. Shimonoseki, and Moji in Kyushu, are on either side of a channel of water and are connected by steam-launches. The trunk line of Kyushu begins at Moji and proceeds by way of Kokura and Hakata running to Tosu where it divides into two directions, and terminating at Nagasaki in the west, and the other at Kagoshima in the southern extremity of Kyushu.

Between Shimonoseki and Fusan, there are four large and magnificent steamships, called Tsushimamaru, Ikimaru, Egesanmaru and Satsumamaru, which give a service of twice per day, connecting with the Korean Railway which is managed by the same administration as the Government Railways of Japan. As stated before, the Korean Railway and this steamer connection will, with the completion of the bridge over the Yalu River form an important travelling route between Japan and Europe.

The trunk line in Hokkaido which starts from Hakodate opposite to Aomori in Hondo, runs northward via Otaru and Sapporo and turning to the east, has a branch line at Iwamizawa, which reaches Muroran on the south. The main line proceeds to Kushiro along the Pacific coast.

PLACES OF INTEREST ALONG THE GOVERNMENT RAILWAYS

Yokohama will interest travellers with its busy harbour and active trade. Its development since it was first opened to foreign trade in 1856 is marvelous. It was at that time a poor fishing village of scarcely one hundred cottages but it is now the largest and most prosperous trading port in the Orient.

Traveling to the north by a railway line of 18 miles travelers reach Shimbashi Station in Tokyo, the capital city of Japan with a population of about 2 million. This line was the leader of the whole system of railways in Japan, and was opened for traffic in 1872.

As Tokyo is the place of the Imperial residence and the seat of the Japanese Government, travelers will find it full of interest to study the essence of the modern civilization of Japan, and to observe some of the splendor of the by-gone days of the Tokugawa era by visiting the many and most interesting shrines, temples and buildings of ancient generations, with other relics of the past.

Starting a fresh journey northward from Uyeno, another station in Tokyo, by a trunk line and changing carriages at Utsunomiya, 65 miles from Uyeno, travelers reach Nikko, a place noted for its unique combination of natural beauty and wonderful art, after a ride of 25 miles.

A day extra at Nikko will enable visitors to take a trip to Kegon waterfalls and Lake Chuzenji.

Matsushima bay with its hundreds of pine-clad islets, in which nature seems to have exhausted her wonderful arts of creation, can be reached by a further journey of 150 miles northward from Utsunomiya via Fukushima and Sendai.

This trunk line leads to Aomori, where it meets another trunk line running along the coast of the Japan Sea. The latter line, though it has not so many beautiful spots as the former, which skirts the Pacific Coast, passes through districts famous for mines, forests and hot springs, a country that waits development in the future.

It would not be without interest to extend the trip to Hokkaido or Ezo-ga shima, as the island was called in the past, crossing the Tsugaru strait from Aomori. It was only a score of years ago that Hokkaido was first brought under cultivation and it is still thinly populated, but its mountains, rivers and lakes bear continental features and abounds in natural products, such as coal, timber, agricultural and marine products. Hokkaido is, indeed, a store house of treasures, and opens up a large field for development and enterprise.

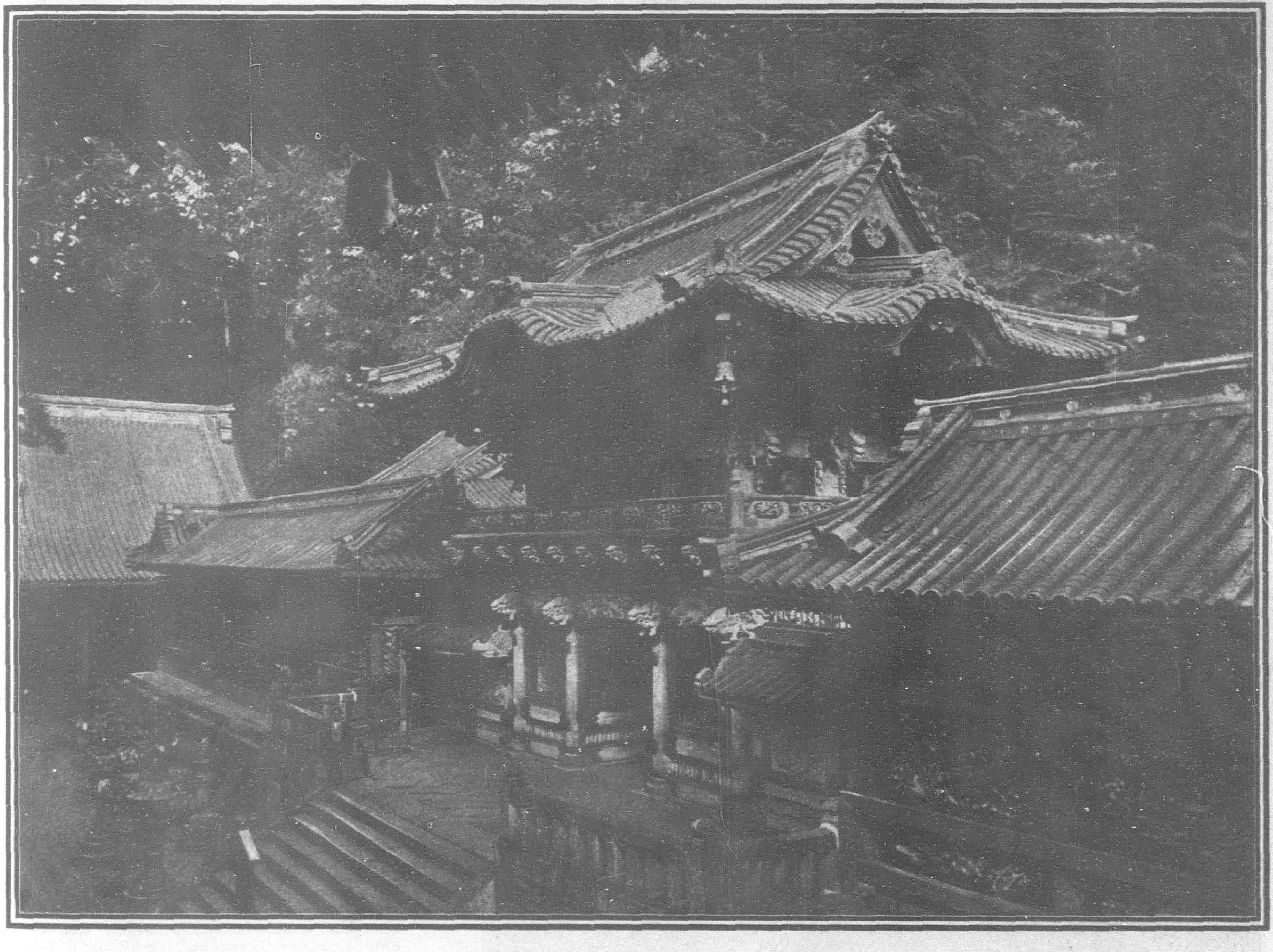
It is on this island that the Japan Steel Works, undertaken jointly by English and Japanese capitalists, have been established. Those travelers who take interest in the study of anthropology, will have an opportunity to observe the life, manners and customs of the Ainos, the survivors of the primitive age.

On the westward trip from Yokohama travelers can visit Kamakura on the Yokosuka branch and have a chance to reflect upon the days of yore by looking at the huge bronze statue of Buddha; Kenchoji, a large temple of the Zen Sect of Buddhism; and the remains of ancient times at Hachiman Shrine, which have many historic associations. Travelers may spend half a day on the fairy islet of Enoshima and resume their westward journey at Fujisama which is reached by an electric railway from Enoshima. To the west of Fujisawa is Oiso, a famous sea-bathing place in summer.

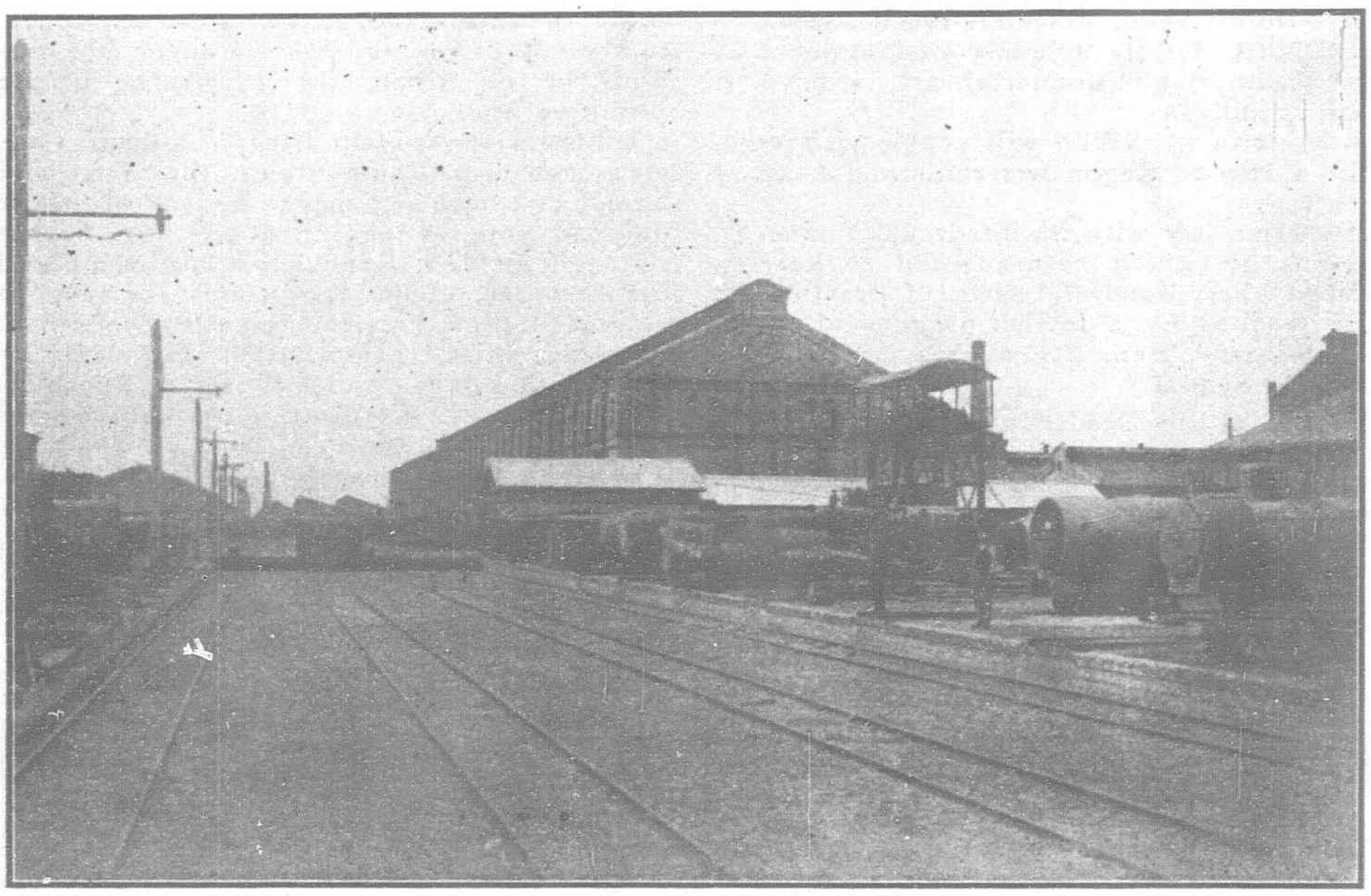
Further westward the train stops at a station called Kodzu, thence to Yumoto, at the foot of the Hakone mountains, the Switzerland of Japan, is reached by an electric railway of 7 miles. From Yumoto rickshaws or palanquins will carry visitors up the mountainous pass. Hot springs gush out everywhere in the mountain valleys and visitors will be made to fancy as if they were in a fairy land. On the top of the mountain there is a lake named Ashi in which Mt. Fuji is perfectly mirrored and presents a most beautiful sight.

Atami, a hot spring resort and an unrivalled resting place, has a spring-like climate throughout the year; it is 16 miles southward from Odawara, about 3 miles west of Kodzu, and is reached by a light railway from Odawara.

At Gotemba, on the trunk line which goes



YOMEIMEN (GREAT GATE) AT NIKKO TEMPLE



OMIYA WORKS OF THE IMPERIAL JAPANESE RAILWAYS EXTERIOR

round the steep pass of Hakone, Fujisan, the sacred mount soaring up into the azure sky with the outline similar to that of a fan hung upside down, is seen. This mountain, an extinct volcano of 12370 ft. in height, has been revered from olden times as the guardian of the country; its conical summit is covered with snow all the year round. The base extends a distance of 20 miles and presents a grand aspect of the continent. Thousands of people ascend the mountain from the beginning of July to the end of August. Foreign visitors cannot be said to have seen the true beauty of Japan, unless they have witnessed the rising sun from the top of Mt. Fuji. Travelers to this locality can leave the train at Gotemba Sano, or Otsuki on the Central Eastern Line.

Mio-no-matsubara, a sandy promontory clad with pine trees, two and a half miles from Oukitsu, affords an excellent place to view Mt. Fuji across the bay.

Shidzuoka is noted as being the former residence of the Tokugawa Shoguns. Its chief products are tea and lacquer-ware.

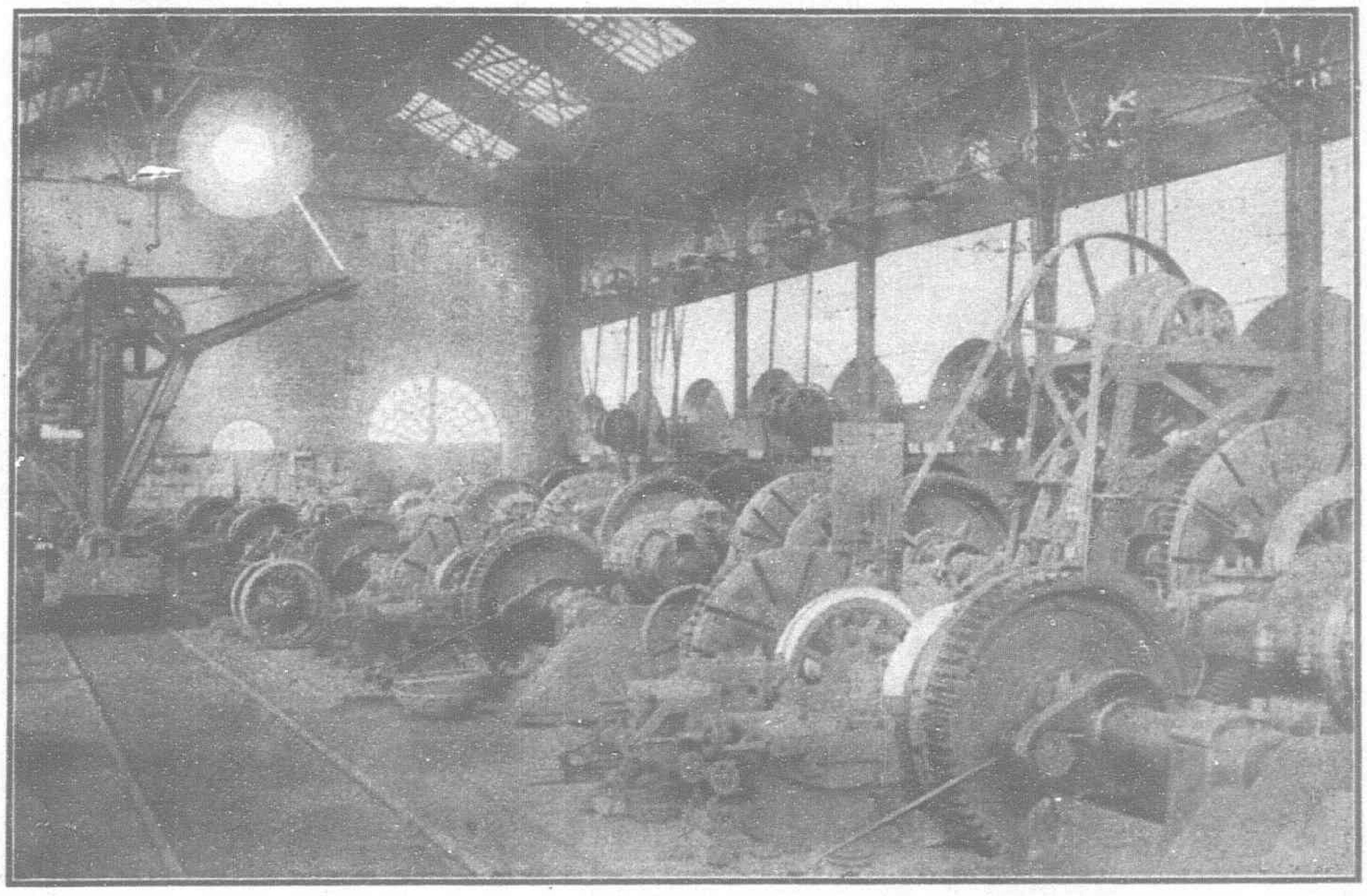
After Shidzuoka, the railway runs through a charming hilly country, crossing the great rivers, Oi and Tenryu, thence to Hamamatsu. Just beyond Hamamatsu the line reaches the beach of Hamana which was at one time a lake, but now forms a lagoon open to the ocean, as the land was washed away by an earthquake. There is in the lagoon, a small island called Bentenjima, a place noted for sea-bathing; in the summer season, a temporary station is opened for the convenience of visitors.

At a distance of 233 miles from Tokyo, stands the city of Nagoya, which after Tokyo is the most flourishing city on the Pacific coast and is celebrated for its feudal castle, which was built in 1610 and distinguished from other castles by a pair of gold dolphines on the top of the five storied donjon.

A line branching off at Nagoya leads to Yamada where there are two grand shrines dedicated to Japanese ancestors, who are worshiped by the entire nation from the Emperor down to the humblest man, and there is an endless succession of pilgrims to these shrines year in and year out.

From Kameyama this line branches through beautiful valleys to Nara.

The trunk line turns to the west at Gifu a place noted for cormorant fishing, and reaches Maibara where the Hokuriku line branches off for Tsuruga, an important commercial habour on the Japan Sea, which, connecting with Vladivostok across the Japan Sea, forms a gateway to Japan for the Russia-Japan through traffic. The Hokuriku line runs through a district named Hokurikudo, productive of rice and minerals and its further end is still under construction.

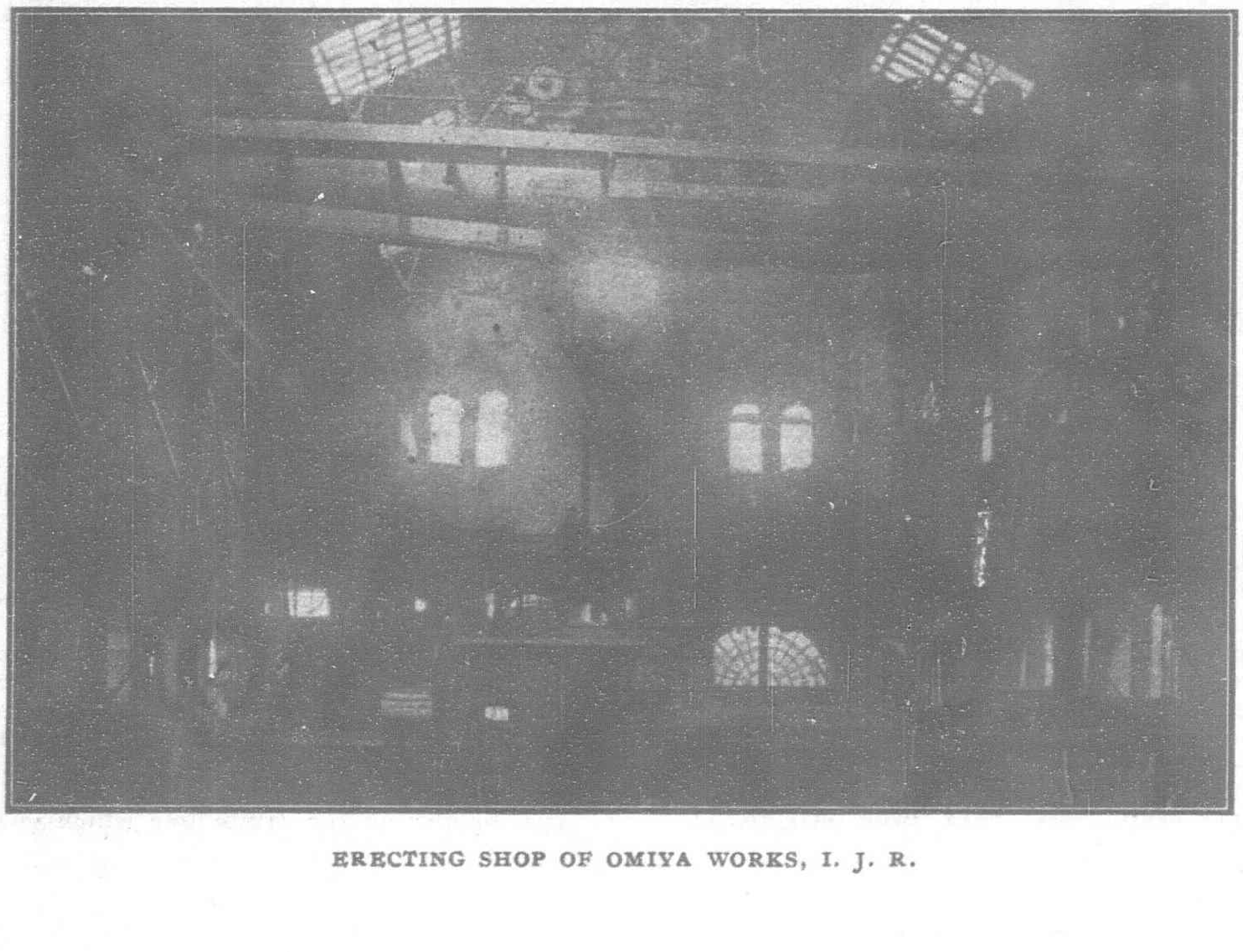


INTERIOR OF OMIYA WORKS, I. J. R.

Travelling further westward from Maibara by the trunk line which skirts Lake Biwa, the largest lake in Japan, Kyoto is reached in a few hours.

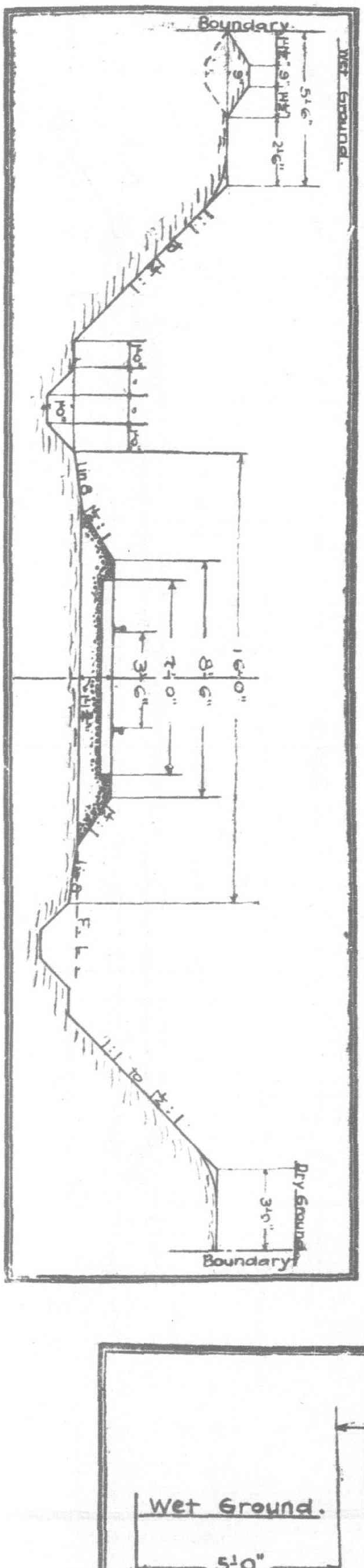
Kyoto was the capital of the Empire from the 8th century until the Restoration and there is still to be seen there the beautiful old Palace of the Emperor. This city is most beautifully situated, its magnificent cinnabar temple buildings which are seen among the gay flowers and the foliage of trees, afford visitors a glimpse of ancient Japan. The exquisite works of art to be found in Kyoto are the pride of Japan, and are not excelled in any other part of the world.

Nara, 26 miles southward from Kyoto, was the capital of Japan in the 8th century. Shrines and temples are found here and there among the cedar woods at the foot of green hills. Here is also seen the Todaiji, a famous Buddhist temple in which is enshrined a colossal statue of Buddha. The herd of tame deer—so well known in this locality—will be greatly enjoyed by all in the Kasuga Park, a park of poetry and romance and of exquisite beauty in its isolation from the busy world.



ERECTING SHOP OF OMIYA WORKS, I. J. R.

CUTTING



MIYANOSHITA, AN IDEAL HOT SPRING RESORT, HAKONE

The railway lines from Kyoto and Nara meet at Osaka, which is the Manchester of Japan and is the most flourishing industrial city in the Far East.

Ama-no-hashidate is famous for its scenery which is so characteristically Japanese. It is a long narrow strip of land covered with green pine trees running far into the sea, and can easily be reached by a steam-launch from Maidzuru at the end of a line branching off near Osaka.

From Kyoto the trunk line continues to Osaka and then to Kobe, the largest open port in West Japan.

Leaving Kobe travelers may enjoy the scenery of the Seto Inland Sea noted for its mild climate and picturesque islands. Okayama where there is a typical Japanese landscape garden called Korakuen; Onomichi, which reminds travelers of the scenery of Southern Europe; and Hiroshima, the largest city in the district west of Kobe,—are the important places on the trunk line.

Trains on the trunk line stop at Miyajima. Miyajima islet on which is Itsukusima Shrine, is half a mile off the shore. At high tide, the sacred lanterns of the Shrine are partly covered with water and the reflection of the lights on the water forms a beautiful sight.

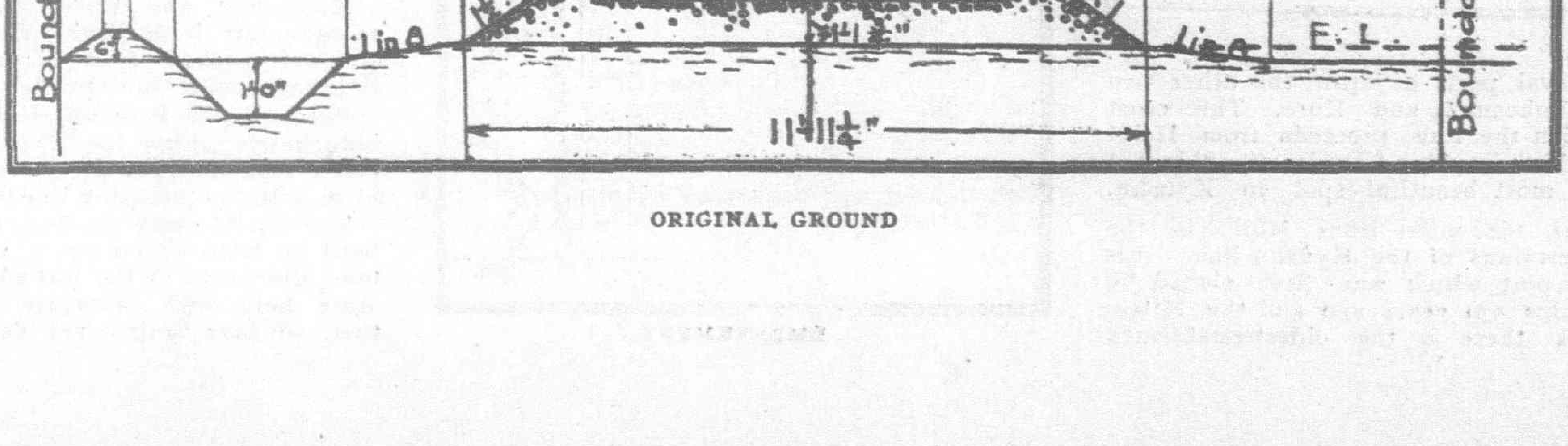
The trunk line terminates at Shimonoseki, 350 miles away from Osaka, where it is connected with the lines of Korea and Kyushu by the above mentioned steamers or steam-launches.

Kyushu holds an important position as the chief locality in the Far East for the production of coal. The total output of coal in Kyushu is 10,000,000 tons per annum, most of which is exported from Moji, Karatsu and Nagasaki.

Moji, opposite to Shimonoseki and situated at the mouth of the Seto Inland sea, is visited by hundreds of boats and ships.

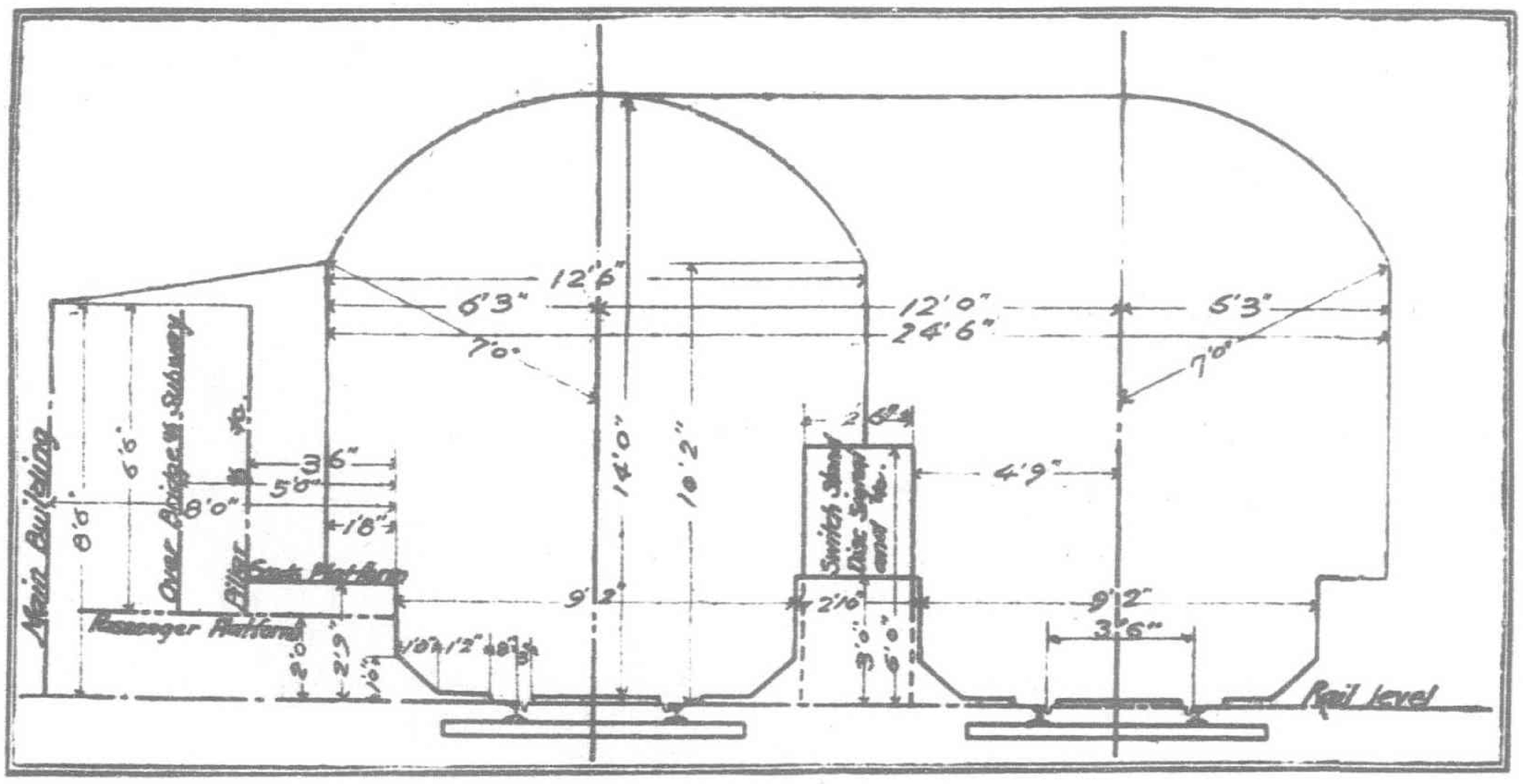
Travelers wishing to visit the valley of Yabakei, where Nature has carved strange figures of stone that lie in a beautiful stream, may travel there by a branch line turning at Kokura for Nakatsu. At Okura is the Edamitsu Iron Works under Government management, and it is at Kashii that the Empress Jingo equipped her warships when she was starting on her expedition to Korea in the 3rd century, and the Kashiijinja is the shrine dedicated to this Empress and the Emperor Ojin who was born of this Empress at the camp is enshrined at the Hakozaki Hachiman.

The trunk line stopping at these places, passes through Chiyono-matsubara, a fine grove of pine-trees and reaches Hakata, the place well known for the manufacture of textile. Tosu, 65 miles distant from Moji, is the junction where the Nagasaki line departs from the trunk line and the cities of Karatsu Imari and Arita lie on this branch or on its sub-branches. Saseho, which is at the terminus of a branch line turning off from Haiki junction, is one of the three

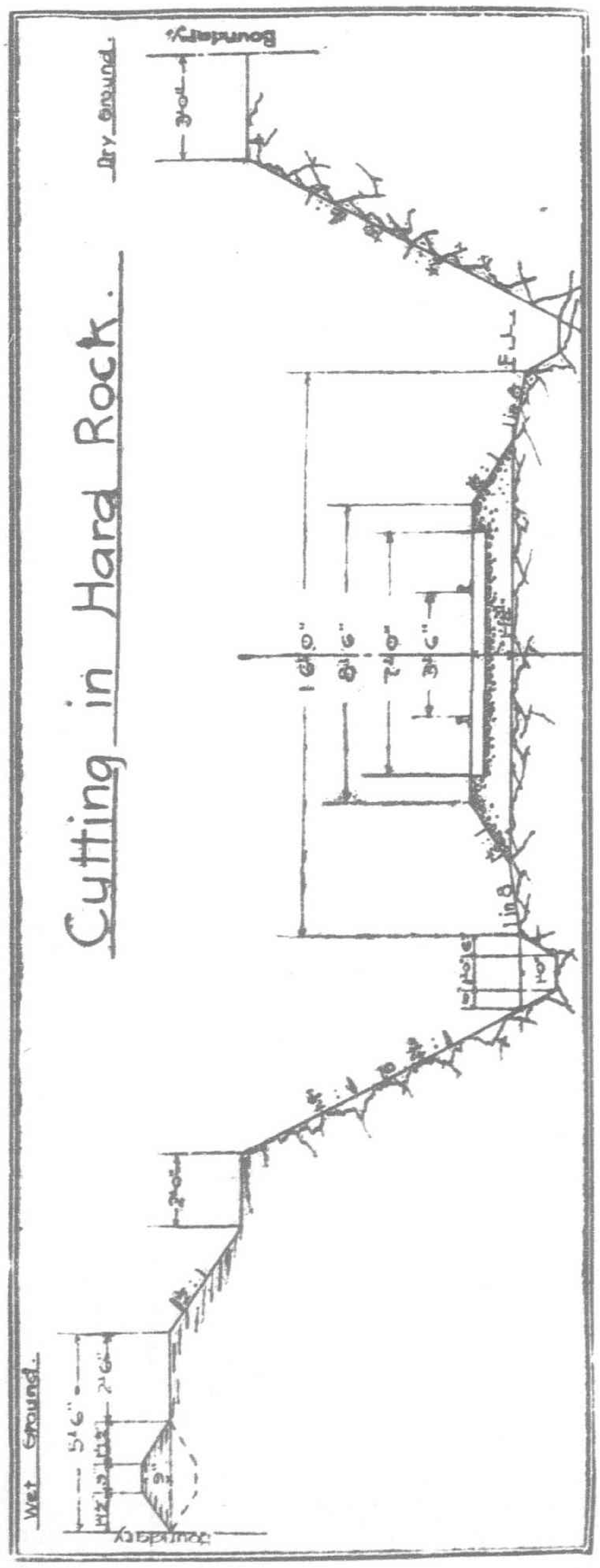


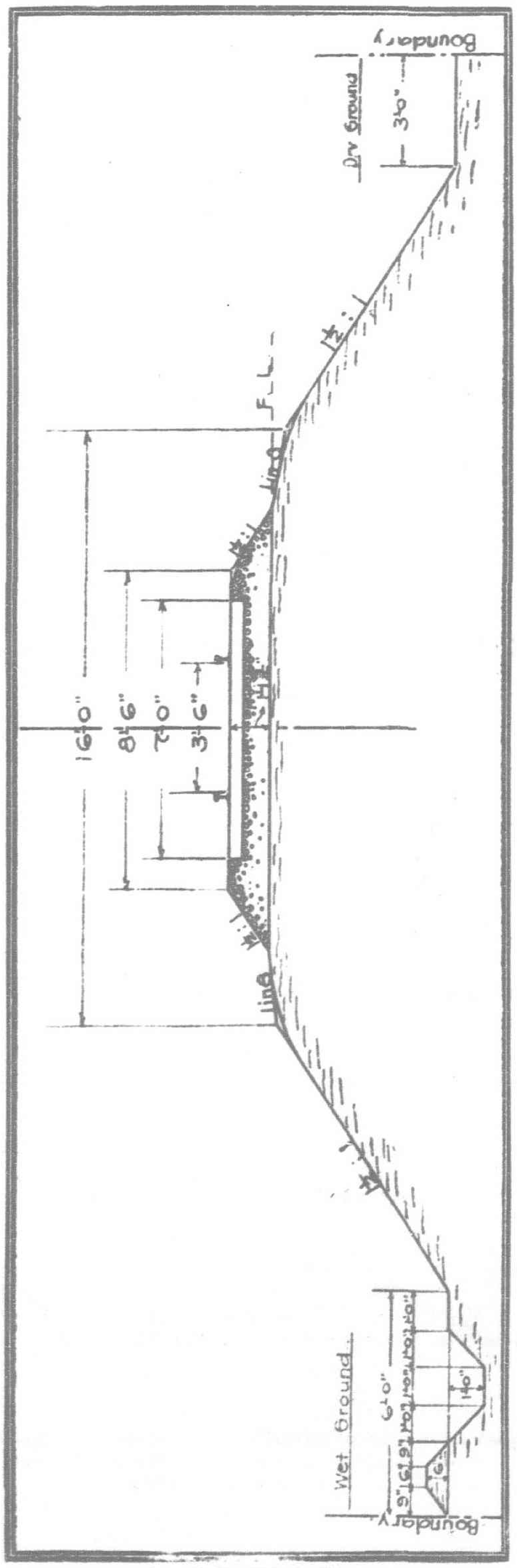
ORIGINAL GROUND

IMPERIAL JAPANESE GOVERNMENT RAILWAYS
STANDARD CROSS SECTIONS OF ROAD BED

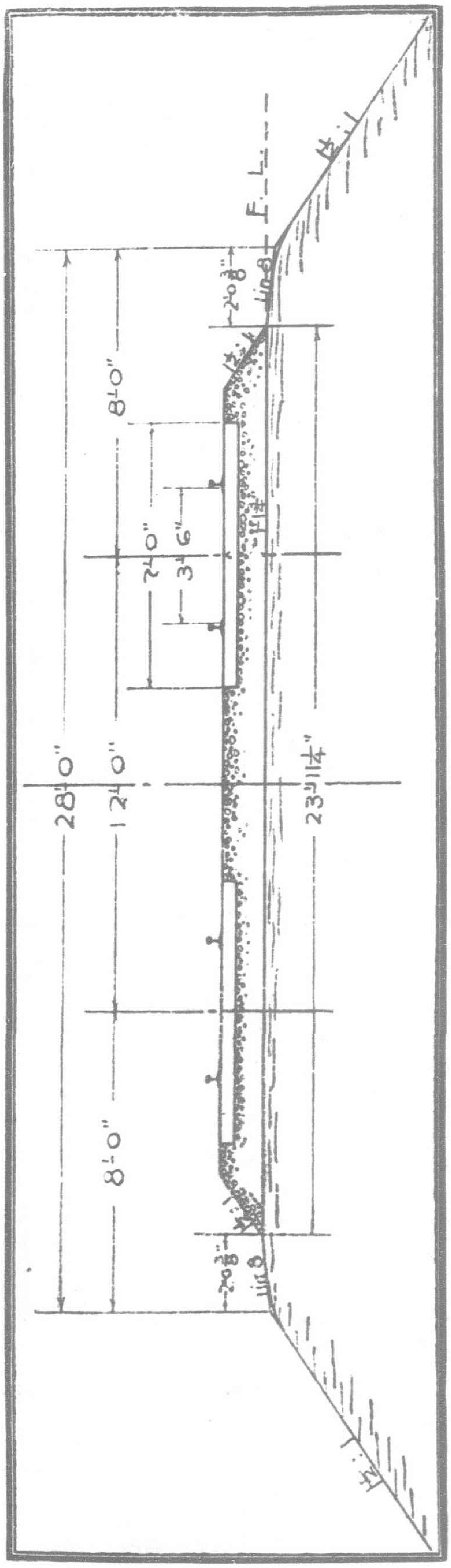


CONSTRUCTION GUAGE IN STATION YARDS





EMBANKMENT



DOUBLE TRACT

greatest naval ports of Japan, the other two being at Yokosuka and Kure. The coast along which the line proceeds from Haiki to Nagasaki has many fine views and is said to be the most beautiful spot in Kyushu.

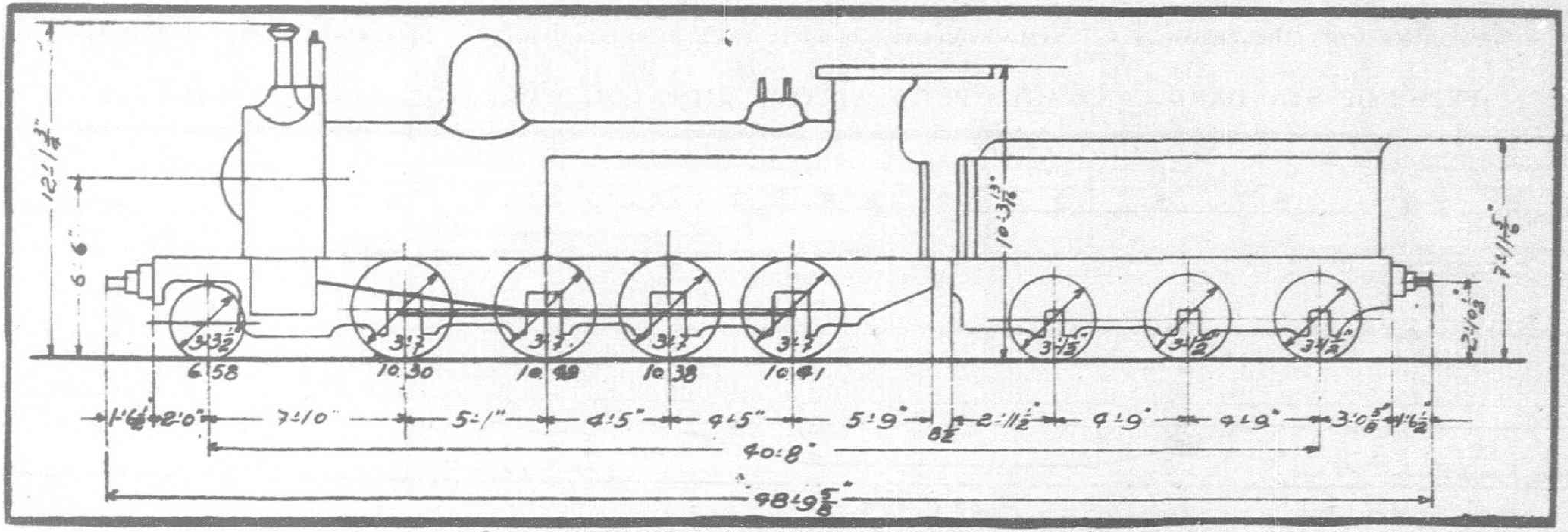
Nagasaki, 164 miles from Moji, is the western terminus of the Kyushu line. It is the open port which was first visited by foreign ships 530 years ago and the Mitsubishi Dock there is the oldest-established ship-building yard in Japan, and is the largest one in the Far East.

Michi-no-o and Unzendake, an inactive volcano, are both popular hot spring resorts and are reached from Nagasaki either by rickshaws or steam-launches.

Returning to Tosu where the Nagasaki line branches off from the trunk line, travelers reach Kumamoto after a southward journey of 56 miles by the trunk line from the junction.

The feudal castle at Kumamoto which was built by Kato Kiyomasa, a retainer of Toyotomi Hideyoshi, is the fort which the Imperial army held with desperate efforts for more than 50 days against the Satsuma Rebellion

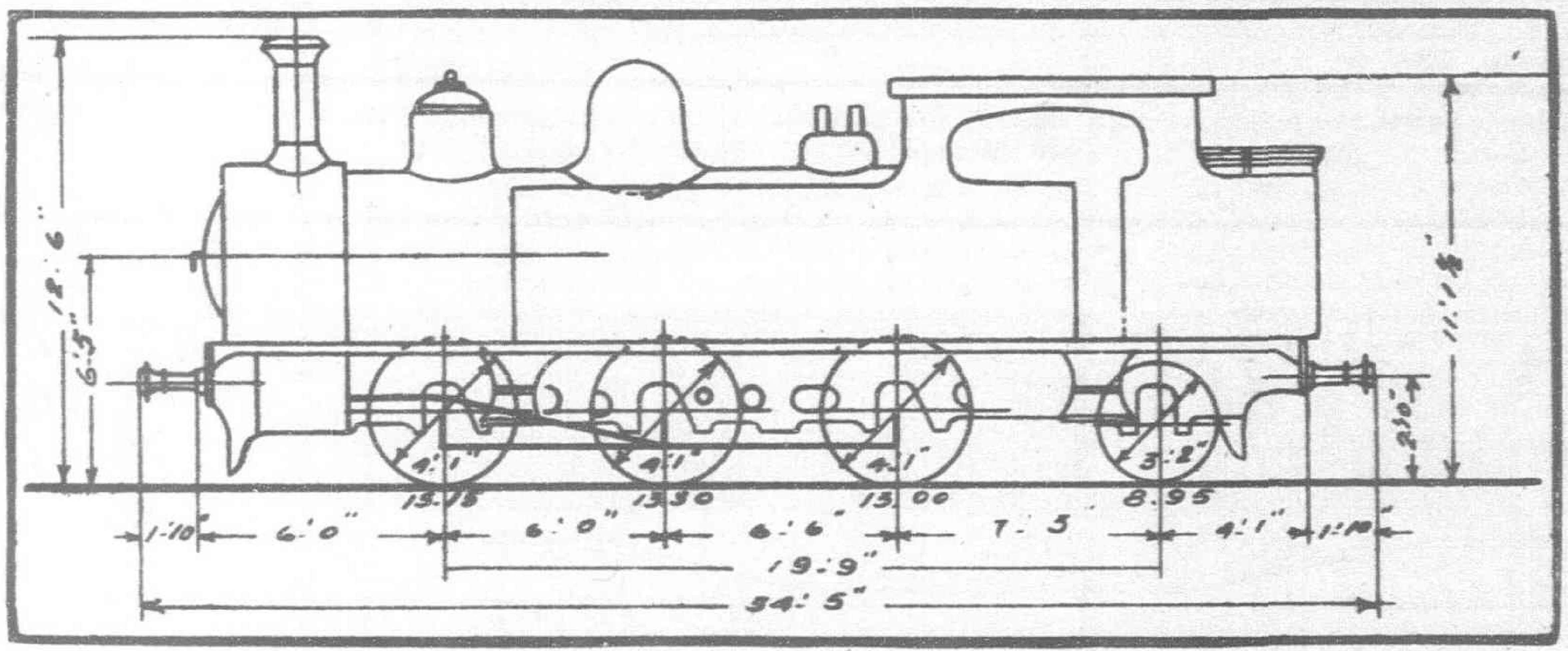
TYPES OF STANDARD LOCOMOTIVES FOR THE I. J. G. RAILWAYS



2–8–0 TYPE GOODS ENGINE (BUILT AT KOBE WORKS)

Diameter of Cylinder	18″	Weight on Coupled Wheels	41.58 tons.
Length of Stroke	22″		
Area of Heating Surface	1186.5 sq. ft.	**TENDER**	
Area of Fire Grate	183.5 sq. ft.	Capacity of Tank	2433 gallons.
Boiler Pressure	150 lbs.	Fuel carried	2.54 tons.
Weight of Engine in Working Order	48.16 tons.	Weight of Tender in Working Order	22.62 tons.

The above drawing shows one of the home-manufactured Heavy Goods Locomotive, which are used on the grade of 1 in 33 or of 1 in 30. This engine can haul 14 of four-wheeled wagons on the grade of 1 in 40, and 10 wagons on the grade of 1 in 30.

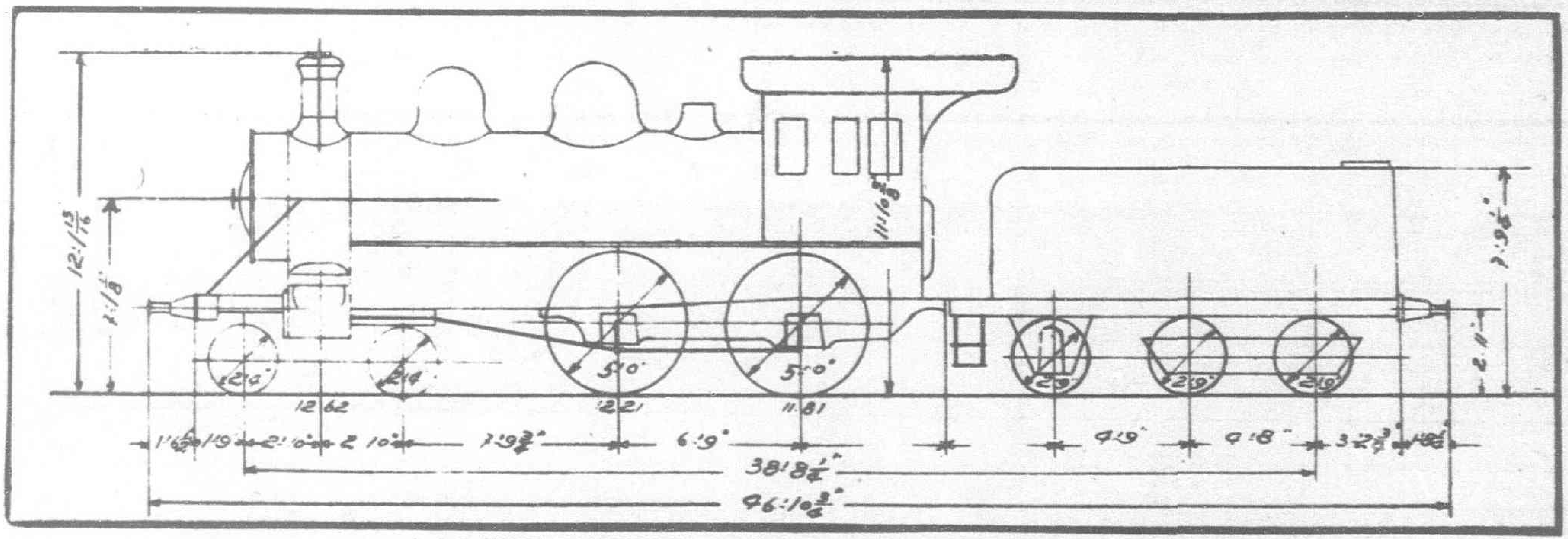


0–6–2 TYPE GOODS TANK ENGINE. (BUILT AT KOBE WORKS.)

Diameter of Cylinder	16″	Weight of Engine in Working Order	48.4 tons.
Length of Stroke	24″	Weight on Coupled Wheels	39.45 tons.
Area of Heating Surface	999.8 sq. ft.	Capacity of Tank	1716 gallons.
Area of Fire Grate	14.1 sq. ft.	Fuel carried	1.87 tons.
Boiler Pressure	160 lbs.		

The above drawing shows one of the home-manufactured Goods Locomotive, which are widely used at mountain sections.

This engine can haul 45 of four-wheeled wagons on level, and 13 wagons on the grade of 1 in 40.



4–4–0 TYPE PASSENGER ENGINE. BUILT AT HYOGO WORKS.

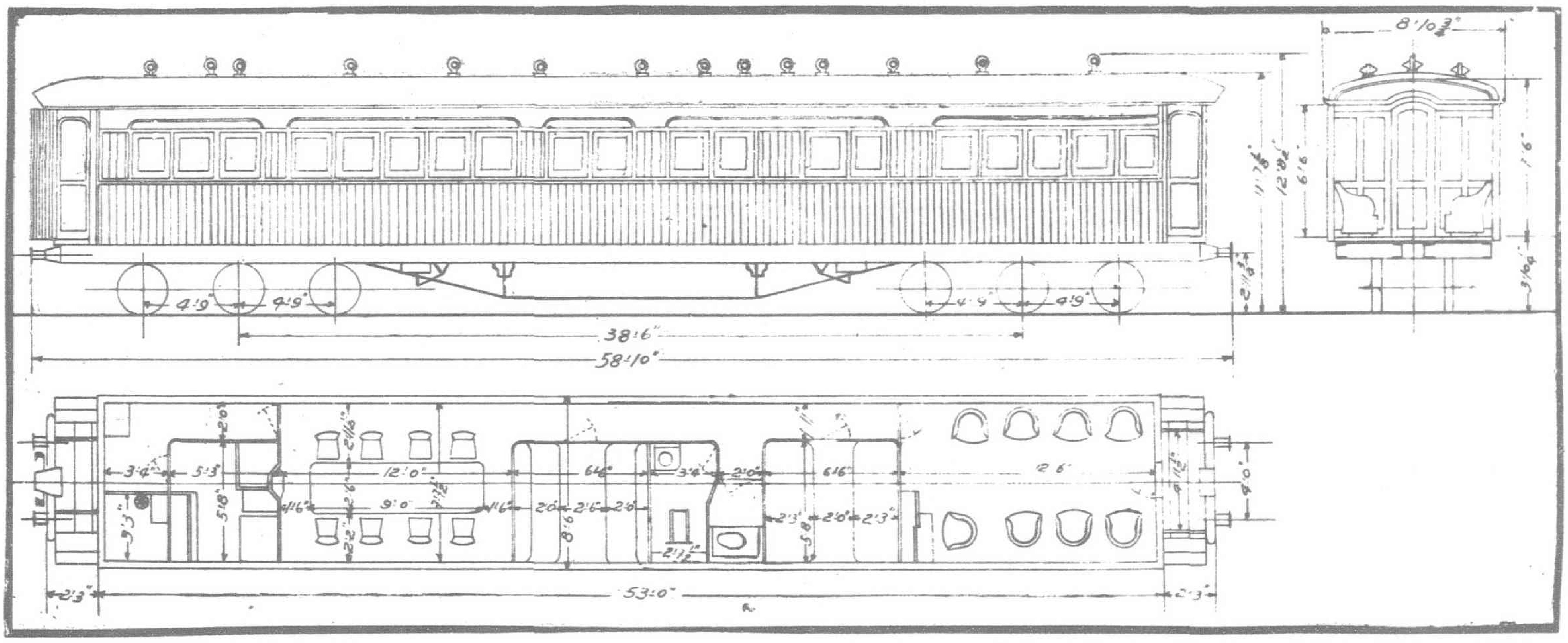
Diameter of Cylinder	16″	Weight on Coupled Wheels	24.02 tons.
Length of Stroke	24″		
Area of Heating Surface	1051.2 sq. ft.	**TENDER**	
Area of Fire Grate	15.7 sq. ft.	Capacity of Tank	1993 gallons.
Boiler Pressue	180 lbs.	Fuel carried	2.8 tons.
Weight of Engine in Working Order	36.64 tons.	Weight of Tender in Working Order	2329 tons.

The above drawing shows one of the home-manufactured Passenger Locomotives, which are used for level sections. This engine can haul 36 of four-wheeled carriages or 14 of bogie carriages running at a rate of about 40 miles per hour.

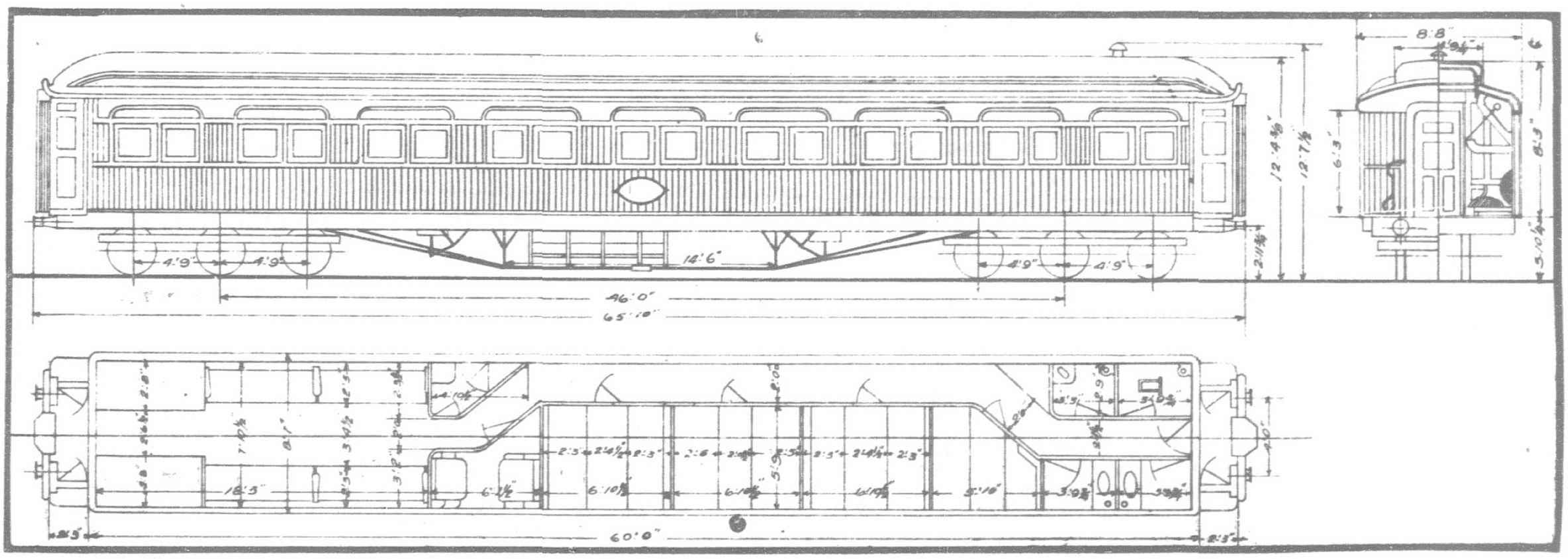
which arose in 1877 under the command of the late Saigo Takamori.

Two and a half miles from the castle is Suizenji Temple which is very well known for its landscape garden. Aso Mountain, an active volcano, rising in the central mountain range of Kyushu, constantly sends up tremendous volumes of smoke, the sight of which makes the blood of lookers-on run cold.

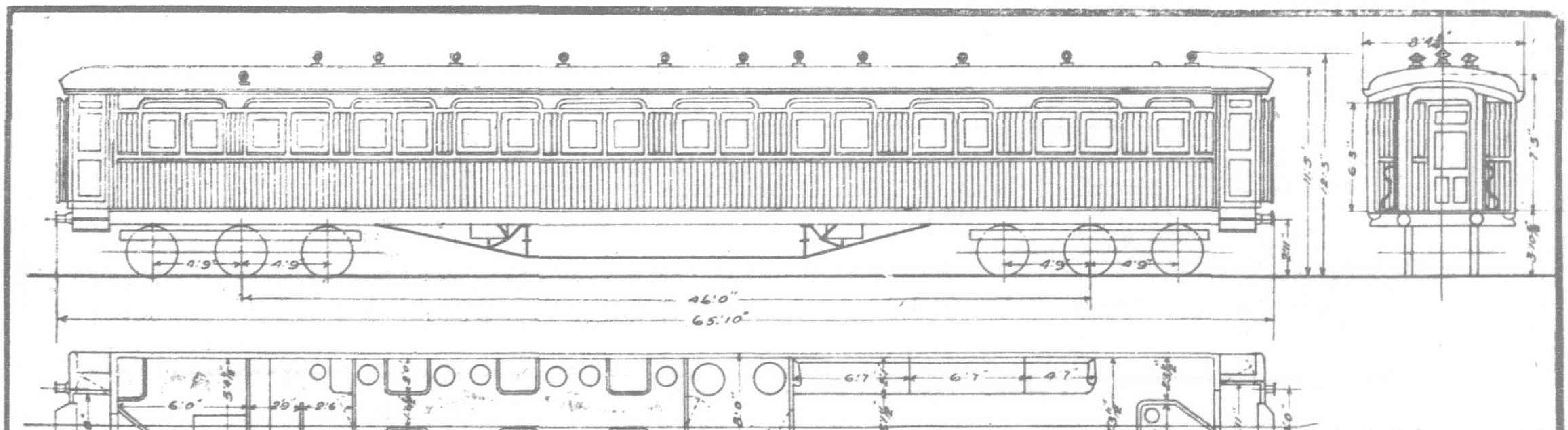
TYPES OF STANDARD CARRIAGES BUILT AT THE SHIMBASHI WORKS OF THE I. J. RAILWAYS



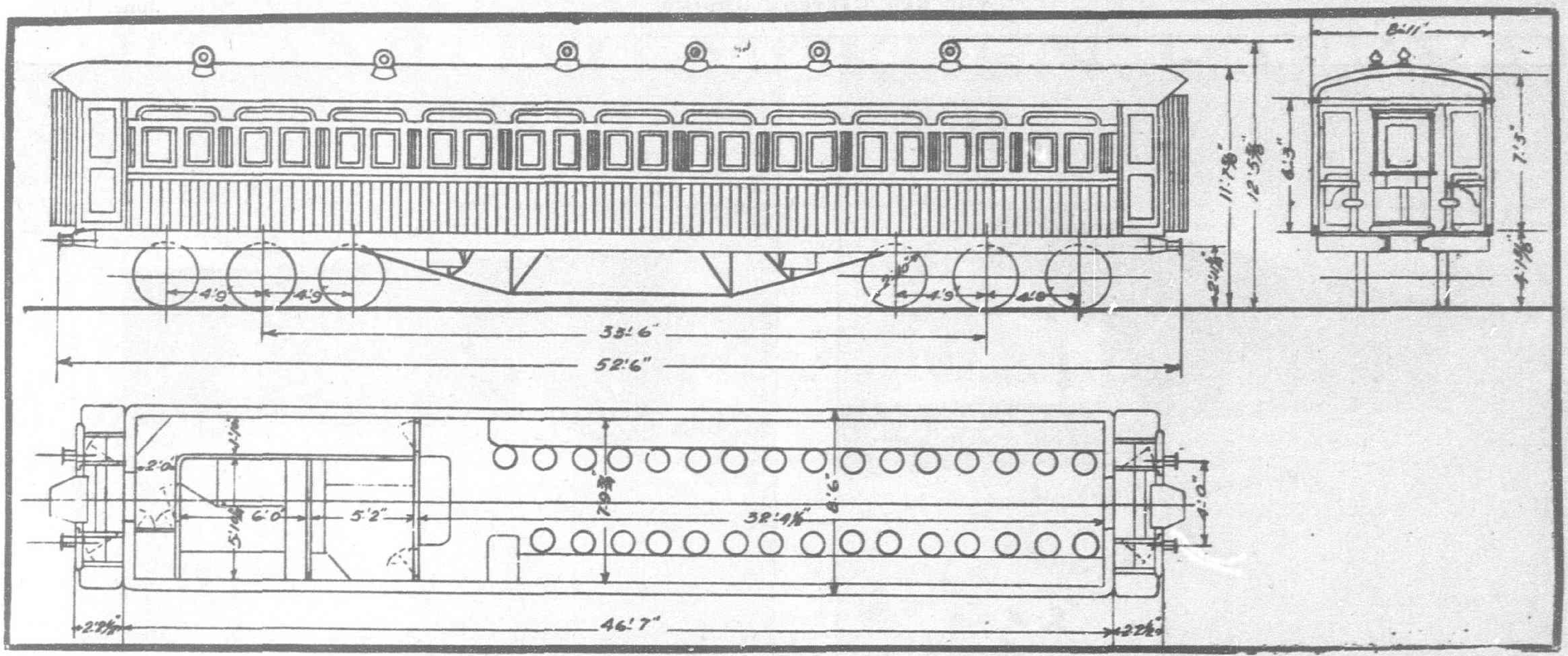
NO. 4. PRIVATE SALOON CARRIAGE, BUILT AT THE SHIMBASHI WORKS, I. J. R.—PERSONS 8; WEIGHT, 27.45 TONS; MAXIMUM LENGTH, WIDTH AND HEIGHT, 58' 10"×8' 10¾"×12' 8½".



NO .5. FIRST CLASS SLEEPING CARRIAGE, BUILT AT SHIMBASHI WORKS, I. J. R.—PERSONS, 26; WEIGHT 3 .19 TONS; MAXIMUM L. W. H.=65' 10"×8' 8"×12' 7¼".



NO. 7. SECOND CLASS COMPOSITE DINING CARRIAGE, BUILT AT SHIMBASHI WORKS, I. J. R.—PERSONS, 23; AT TABLES, 18; WEIGHT, 26.41 TONS. MAXIMUM L. W. H.=65' 10"×8' 4¾"×12' 3".



NO. 7. THIRD CLASS DINING CARRIAGE, BUILT AT SHIMBASHI WORKS, I. J. R.—PERSONS, 31; WEIGHT, 23.46 TONS. MAXIMUM L. W. AND H.=52' 6"×8' 11"×12' 5⅜".

The line between Yatsushiro and Hitoyoshi is built along the rapids of the Kumagawa and over the steep pass of Yatake. The construction of the section extending over 53 miles was most difficult being full of bridges, tunnels, and having a switch-back and a loop-line.

Kagoshima is the southern terminus of the trunk line and is 237 miles distant from Moji. The Shimazu, one of the powerful feudal Lords, had a castle in this city. The city reminds one of the bombardment by the British fleet in 1863, a contrast to the friendly relations, now existing between England and Japan. The Kagoshima clan has produced many distinguished soldiers such as Marshal Oyama and Admiral Togo.

The trunk line which leaves Tokyo toward the north has a branch line at Omiya which after passing Takasaki and Yokogawa climbs the Usui Pass on the line of Abt system with an inclination 1 in 15, passing through 26 tunnels in succession. On the top of the mountain is Karuizawa station, which is 3280 feet above sea-level. Karuizawa is very cool, even in summer, and is one of the most popular summer resorts among foreign residents in Japan. There are hotels with good accommodation and many private country houses.

Asama, an active volcano, which rises to the north of Karuizawa, lords it over the surrounding mountains.

46 miles further north is Nagano. Here is Zenkoji Temple, the Mecca of Japan, whither thousands of pilgrims journey throughout the year.

Passing Nagano, the line enters Echigo Province, famous for rice and kerosene, and terminates at Niigata, one of the first open ports in Japan.

ACCOMMODATION OF THE GOVERNMENT RAILWAYS AND HOTELS PROVIDED FOR FOREIGN TRAVELERS

In the foregoing paragraphs a general description has been given of the places of interest found along the Government Railways and a few words about the accommodations of the Government Railways and hotels providen in these cities may be necessary.

As it is only a few years since the nationalization of railways, there are of course many criticisms to be made with regard to them, but the authorities have made it their business to provide suitable accommodations which contribute to the comfort and safety of passengers. In fact, for the convenience of those passengers traveling a long distance, sleeping and dining cars are attached to express and through trains and European meals are served either "table d'hôte" or "à la carte."

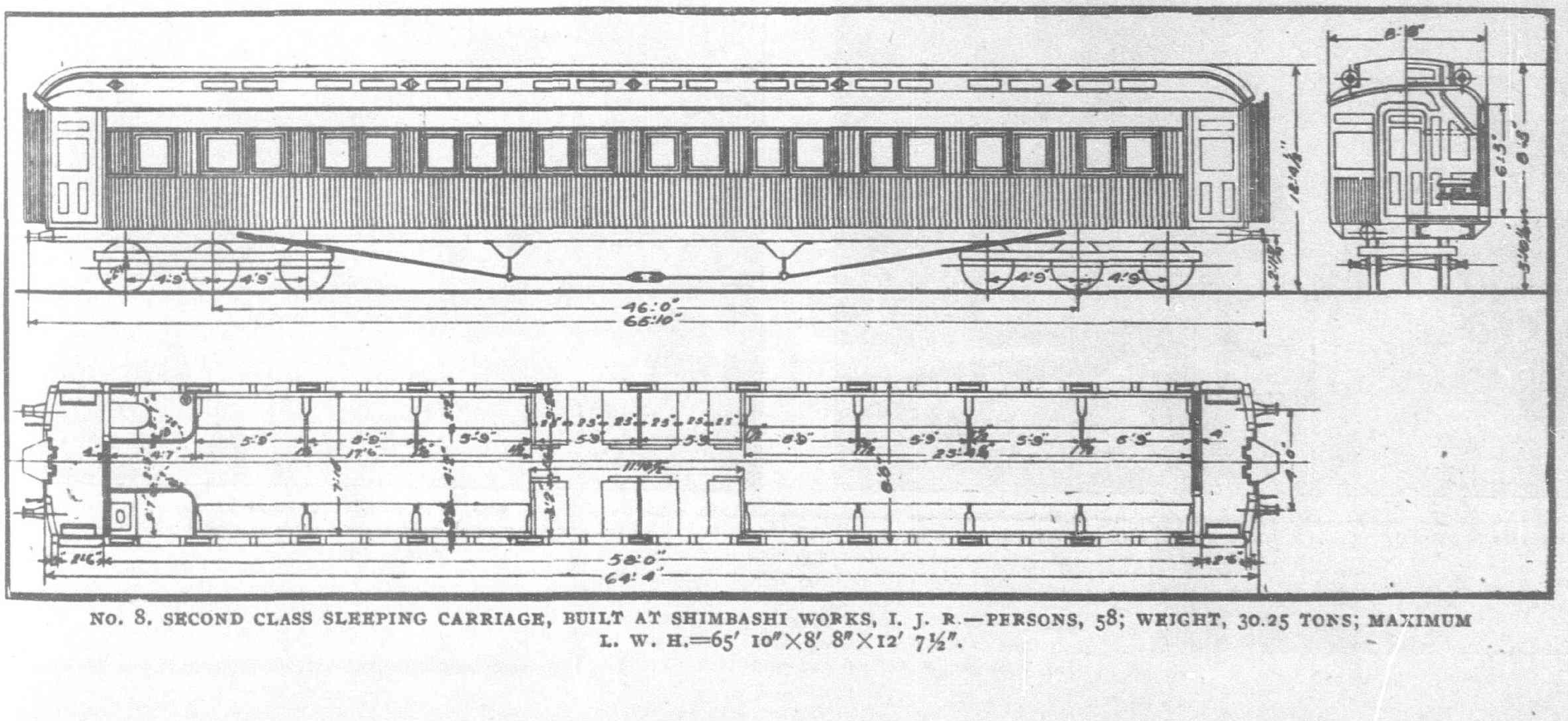
The Japanese are by nature hospitable, but owing to the ignorance of foreign languages, and to the consequent misunderstanding, they are sometimes unable to treat foreign guests satisfactorily, to their regret. This is specially the case with the people of the lower classes. In view of this, the railway authorities pay special attention to the training in English of the railway employees and, in order to attain their object, have established an English School, the graduates of which are now in service on the principal express trains for the purpose of rendering assistance to foreign passengers who do not know the Japanese language. Every station is provided with rickshaws and at the principal stations there are inquiry offices where guides who speak English are stationed, enabling foreign tourists to travel without inconvenience or trouble.

For a luxurious trip a private car can be engaged at a reasonable charge. The cars on the main trains are cooled in summer with electric-fans and warmed in winter with steam heaters. They are lighted by electric lamps, so that passengers can read at night.

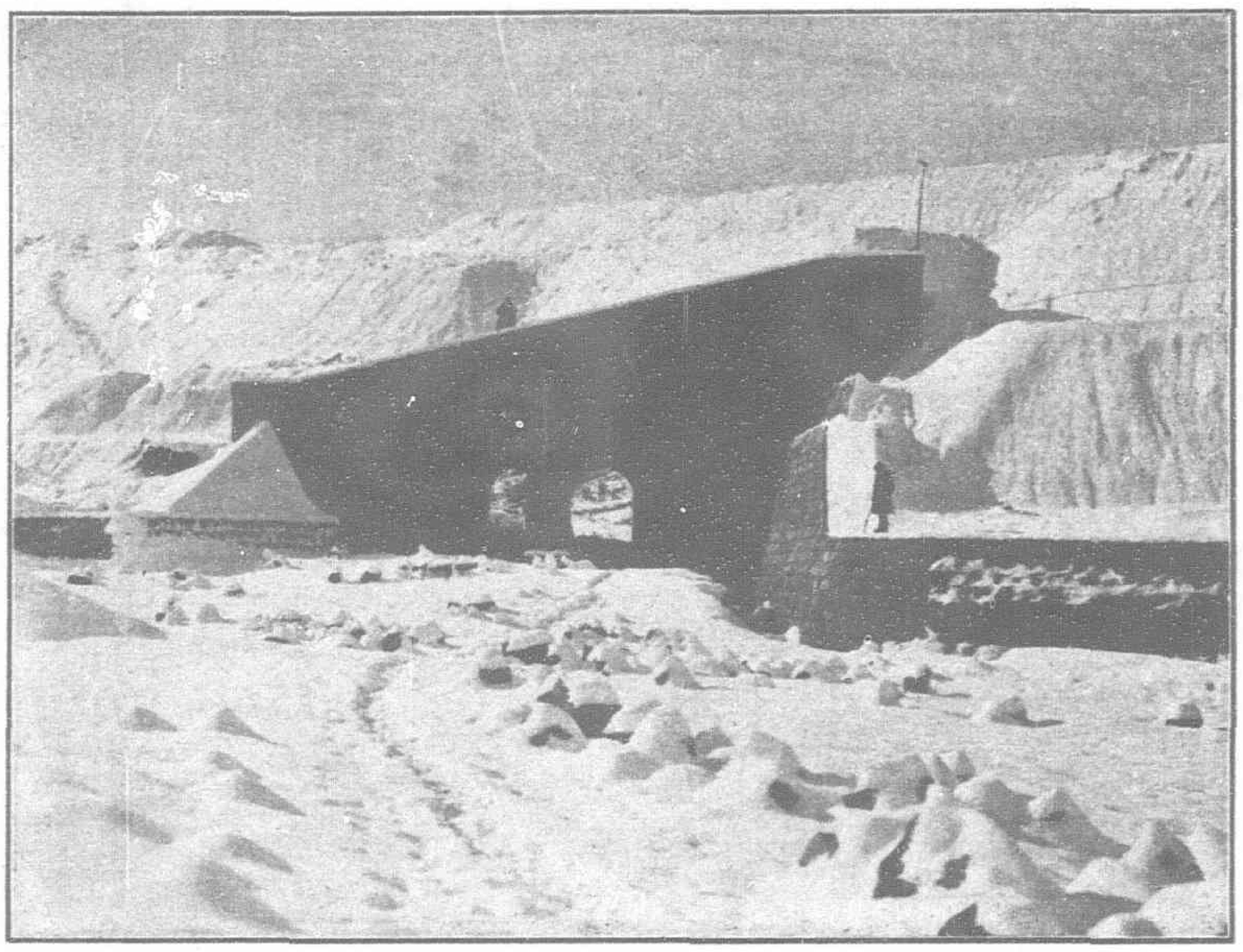
For the convenience of travelers to Japan the Government Railways have tickets sold at the European and American Agencies of Thos. Cook & Son and the International Sleeping Car Company.

The Government Railways conduct a fine hotel in European style at Shimonoseki, the point of communication between Kyúshú and Hondo and the centre of the steamship lines to China and Korea. This hotel is furnished with the best accommodation and excellent cuisine, at reasonable charges, either European or American plan.

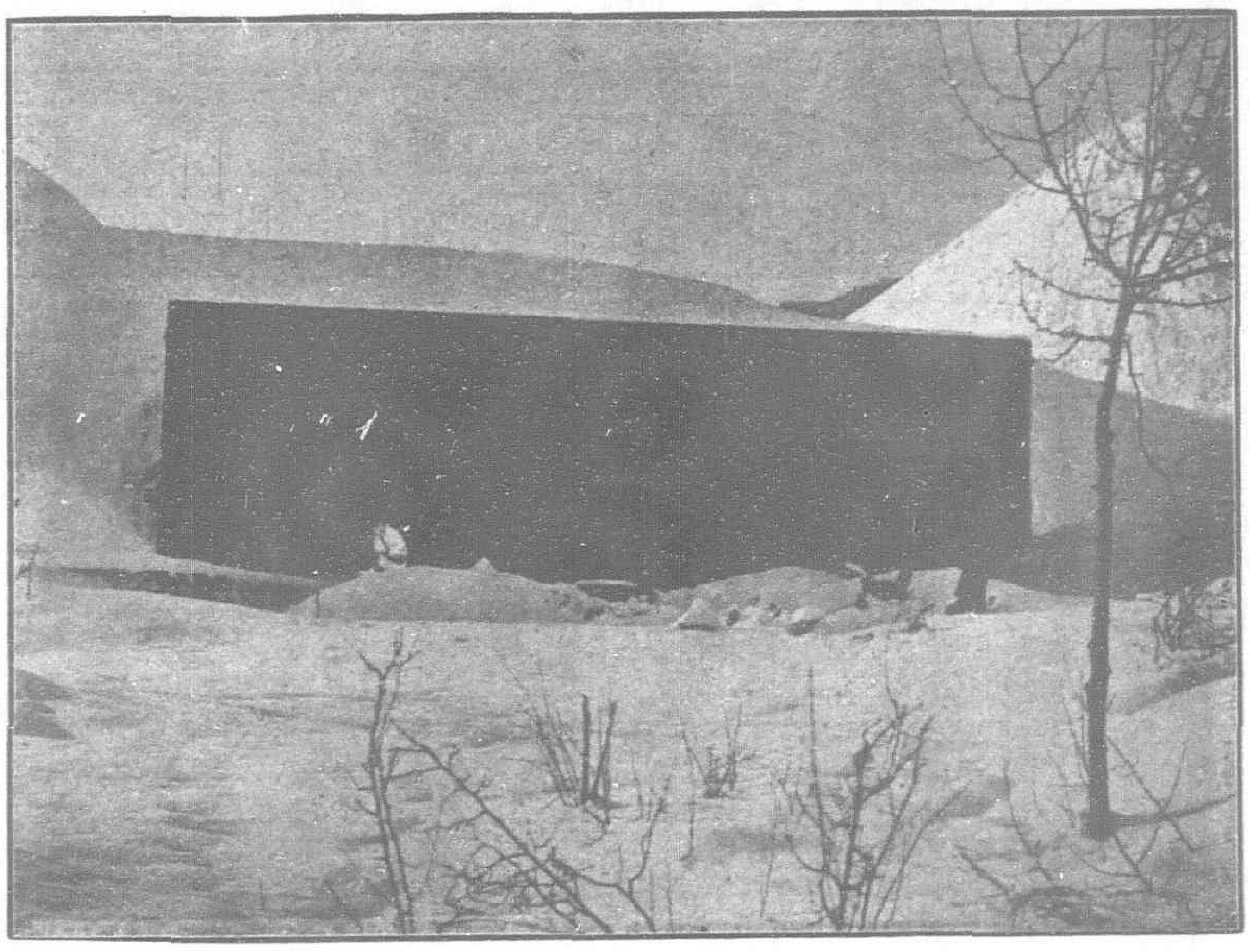
Besides the above railway hotel, there are European hotels in the principal cities and towns such as Nagasaki, Miyajima, Kóbe, Osaka, Kyóto, Nara, Nagoya, Hakone, Kamakura, Yokohama, Tókyó, Nikkó, Karuizawa, and Sendai. The hotels in Kyóto, Nara, Hakone, and Nikkó are specially suited for a stay of several days, being so ideally located that they make excellent resting places for tourists.



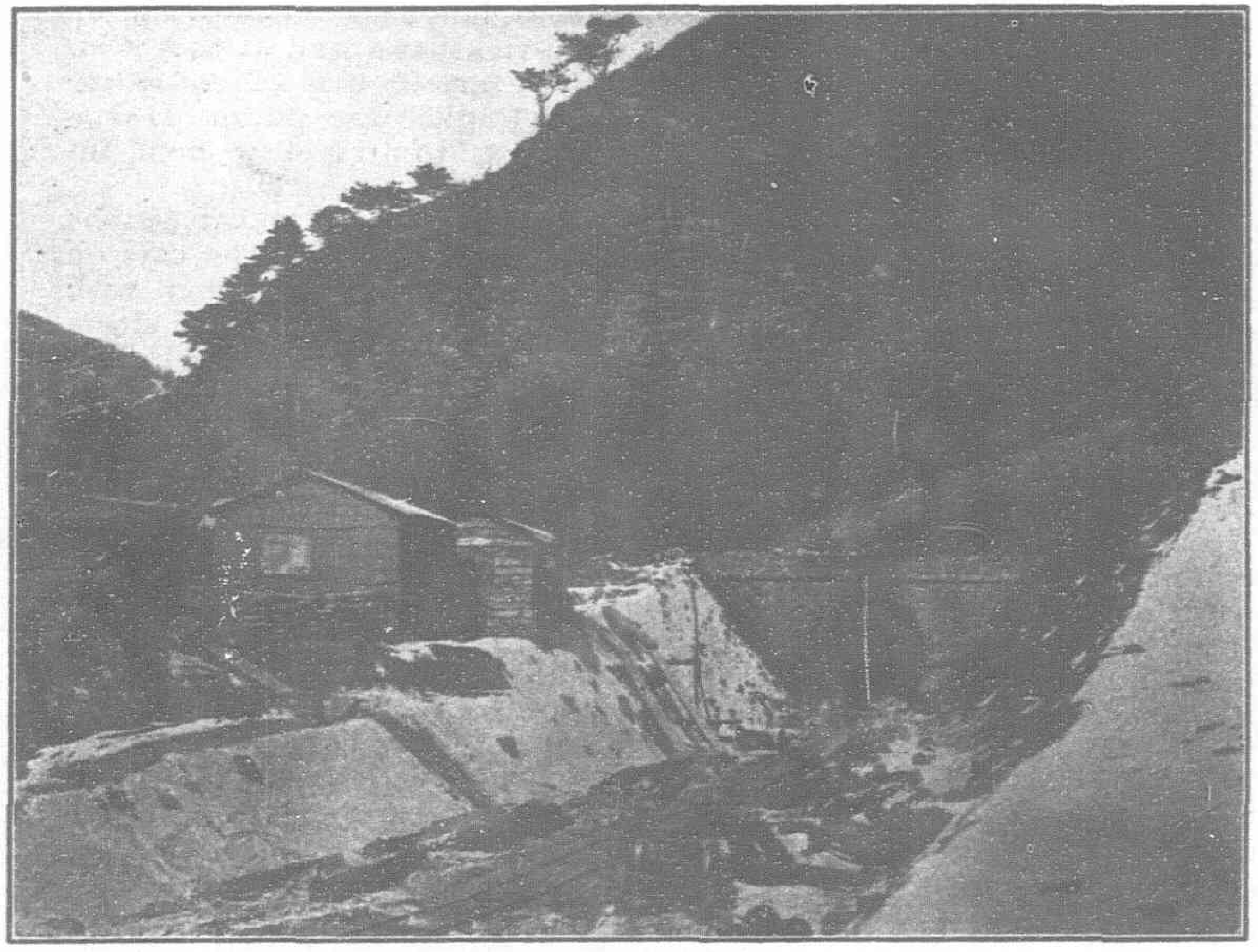
NO. 8. SECOND CLASS SLEEPING CARRIAGE, BUILT AT SHIMBASHI WORKS, I. J. R.—PERSONS, 58; WEIGHT, 30.25 TONS; MAXIMUM L. W. H.=65' 10"×8' 8"×12' 7½".



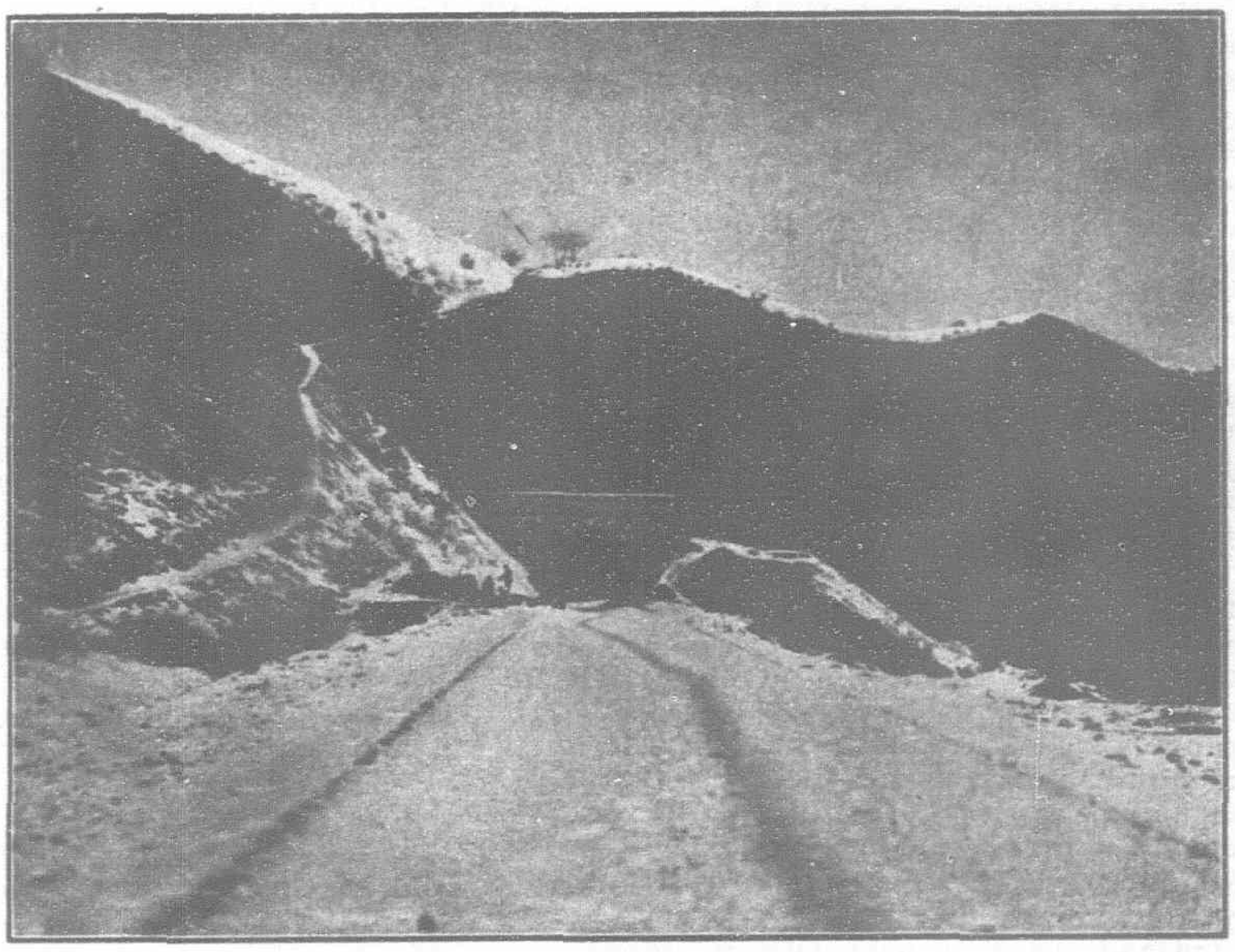
CULVERT NO. 6. NEAR THE WESTERN ENTRANCE OF CHIKUANSHAN TUNNEL (FEB. 1911)



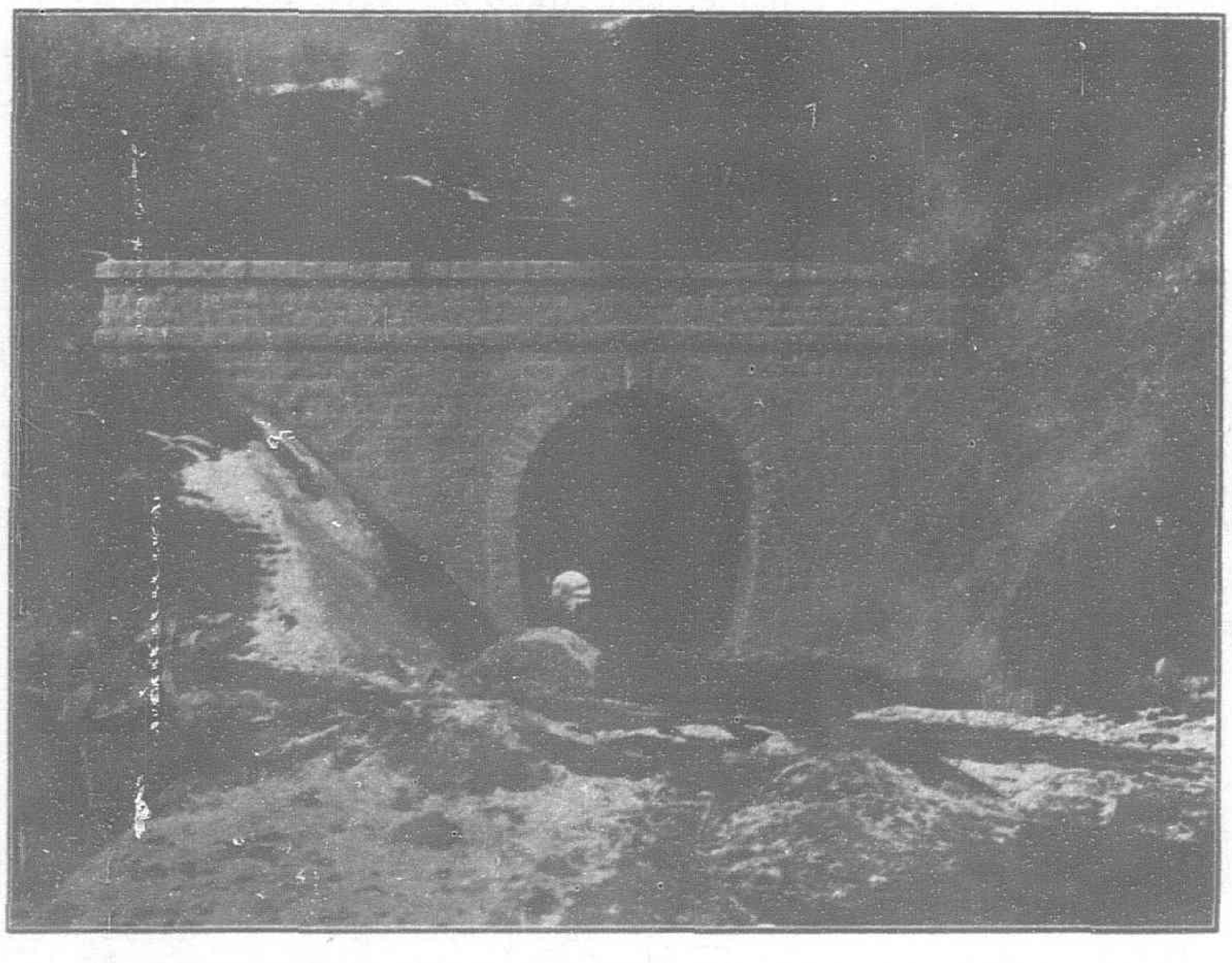
CULVERT NO. 7 NEAR WESTERN ENTRANCE TO CHIKUANSHAN TUNNEL (FEB 1911.)



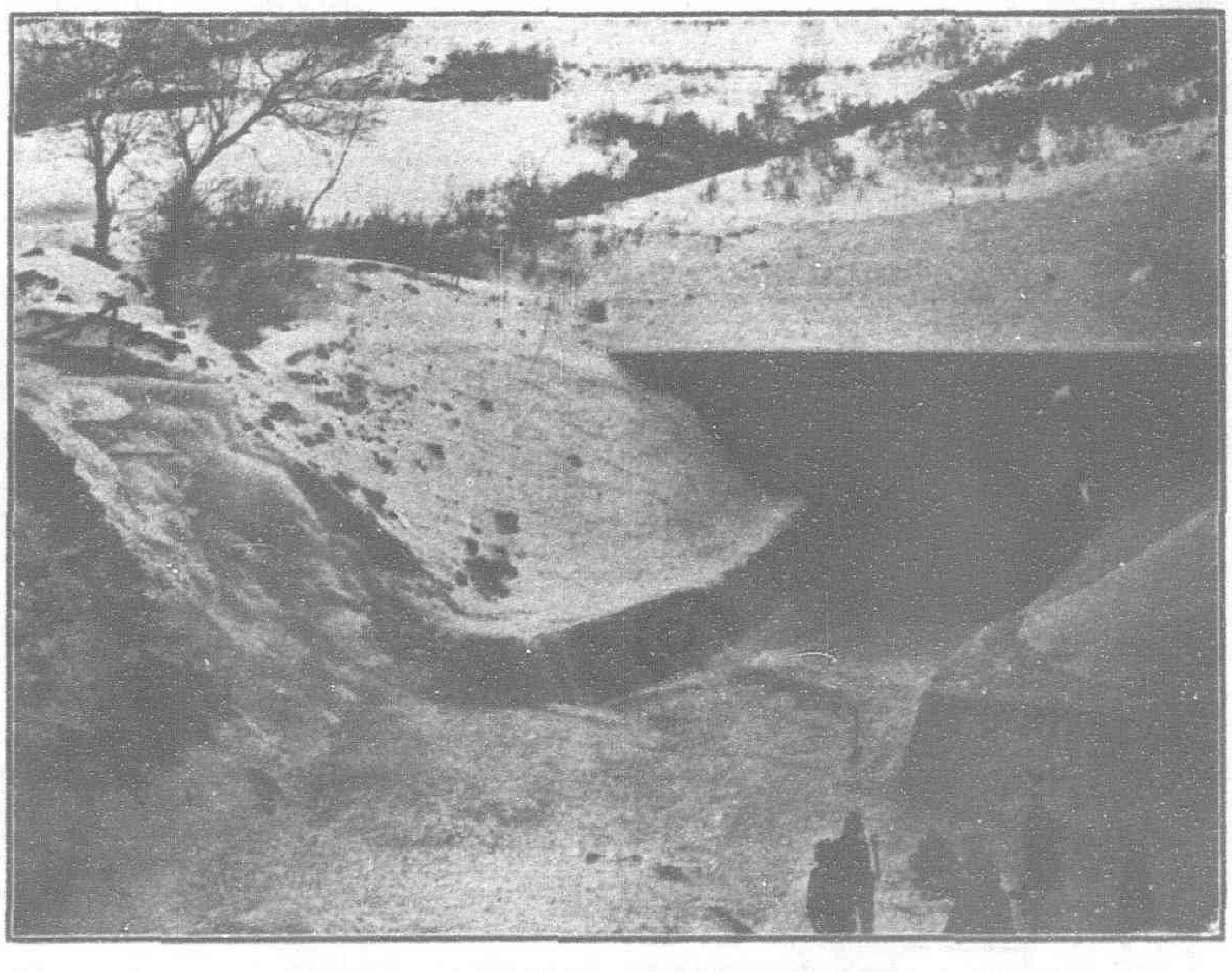
EASTERN ENTRANCE TO KUSUNGTZU TUNNEL (FEB. 1911)



WESTERN ENTRANCE TO CHINLENG TUNNEL (FEB. 1911)

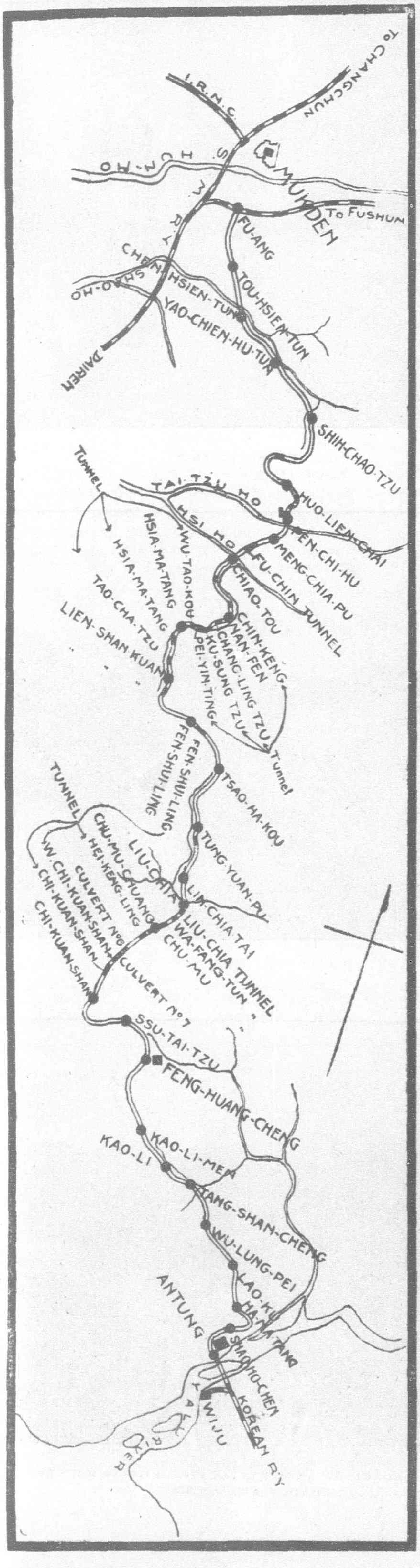


HSIAMATANG TUNNEL, AS SEEN FROM THE EASTERN ENTRANCE (FEB. 1911)



WESTERN ENTRANCE TO TAOCHATZU TUNNEL, (FEB. 1911)

THE ANTUNG-MUKDEN RAILWAY



MAP OF THE ANTUNG-MUKDEN RAILWAY

The railway line between Antung and Mukden, made necessary by the operations of the war between Japan and Russia, stands as a monument to Japanese engineering skill and enterprise, and typifies Japanese advance in Manchuria. This little narrow gauge road conceived during the stress of a great national conflict as imperative for the successful forward movement of the Japanese army into Manchuria, for some time simply served the needs of the army, but exigencies of politics and trade have transformed it into the most important thread in the web of Japan's strategic lines, and a necessary link in the development of transasiatic travel.

Shortly following the occupation of Antung by the Japanese forces in May, 1906, owing to the almost impassable character of the mountain roads in this region and the necessity of facilitating a more rapid movement of supplies, the construction of a light railway was begun by their engineer corps and its extension continued with the advance of the army as far as Shichiaotzu, a point about 30 miles to the southeast of Mukden. The country to the north and west of Shichiaotzu, drained by the Taitzu River, a tributary of the Hun Ho, being quite level and ordinary methods of transportation comparatively easy, this point was then made the terminus of the railway until August of 1908 when the Okuragumi, a large Japanese concern, received from the military authorities a contract to extend it to Mukden.

The gauge was 2 feet 6 inches. The rails as well as the rolling stock, including locomotives and trucks, were supplied by the Baldwin Locomotive Works. The system possessed altogether 150 locomotives, 100 of these being of 16 and the remainder of 11 tons. The freight cars were all open and similar to those used for hauling sand in America. The entire carrying capacity of the railway was only some 1200 tons. Besides these open cars there were a number with tops and designed especially for passenger traffic.

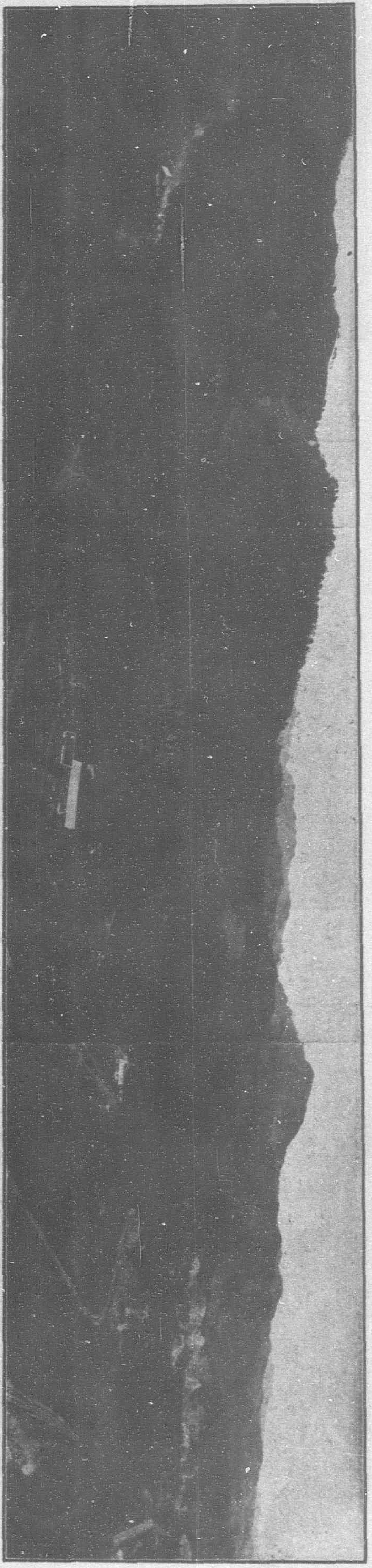
The line remained under control of the military authorities until its transfer to the South Manchuria Railway Company.

The railway was opened to general traffic, both freight and passenger, in August 1908. Two schedule-time runs are daily made from each end in addition to more or less regular ones between some of the intermediate points. The journey from Antung to Mukden requires two days. The through trains both leave in the morning, one at 6 o'clock and the other at 9, and reach Tsaohohu (Sokako) 12 hours later. Operation after dark would of course be subject to a great deal of risk, so that passengers are obliged to pass the night at this point, resuming their journey on the following morning at the same hours as before.

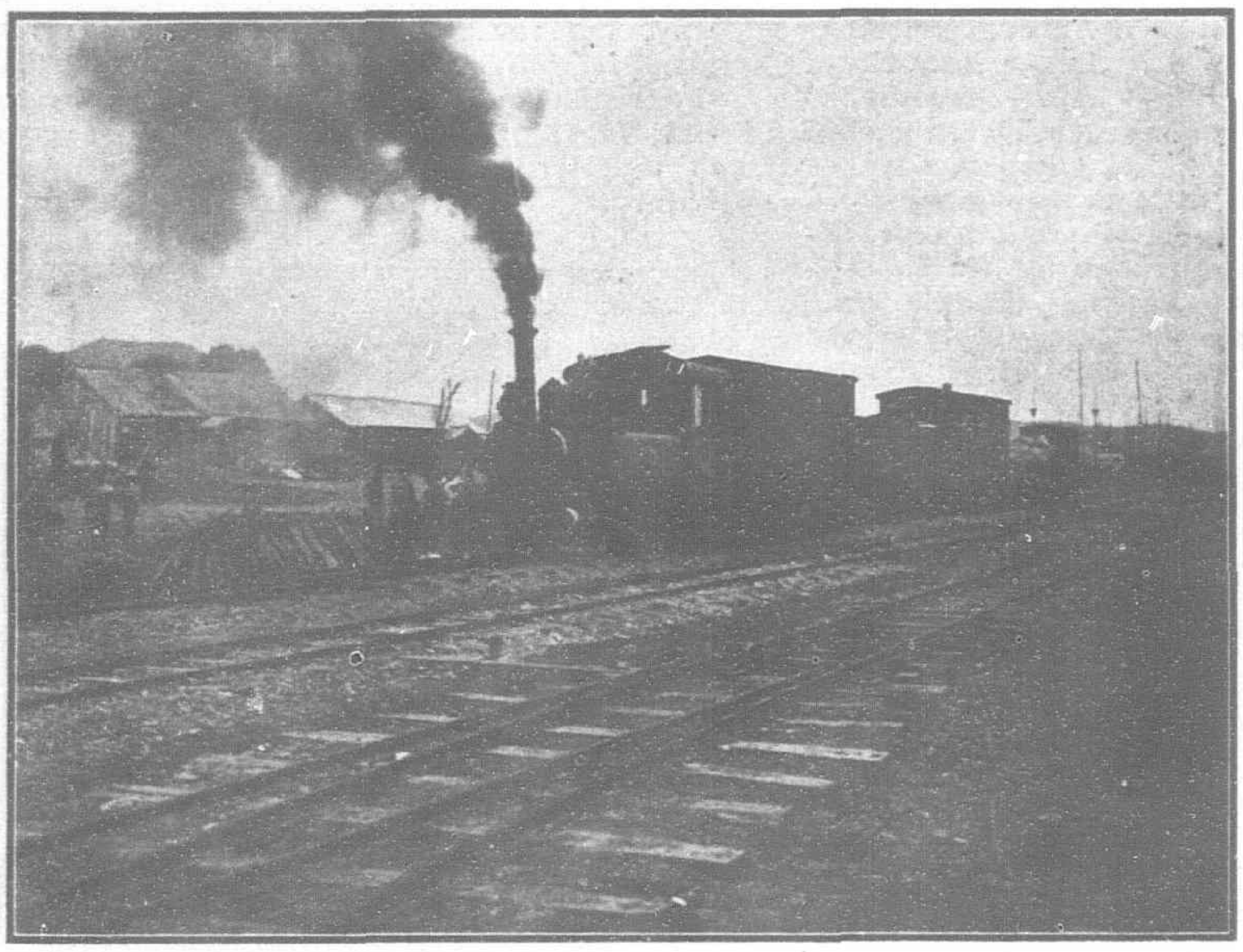
Designed primarily as a military supply line, it was constructed in haste to keep pace with the rapid forward movement of the army, and to avoid the construction of expensive tunnels the line was given a wide detour, with many steep gradients and short, sharp curves. The bridges were hastily constructed of wood and were unsafe for heavy loads. The small locomotive hauling three or four cars, travelled at an exceedingly low speed for fear of derailment, and travel by night was impracticable. The time consumed in covering the 188 miles between Antung and Mukden was two full days.

In other words the line was wholly unsuited for ordinary commercial purposes and after the termination of the war and the withdrawal of the Japanese troops, it had no practical value.

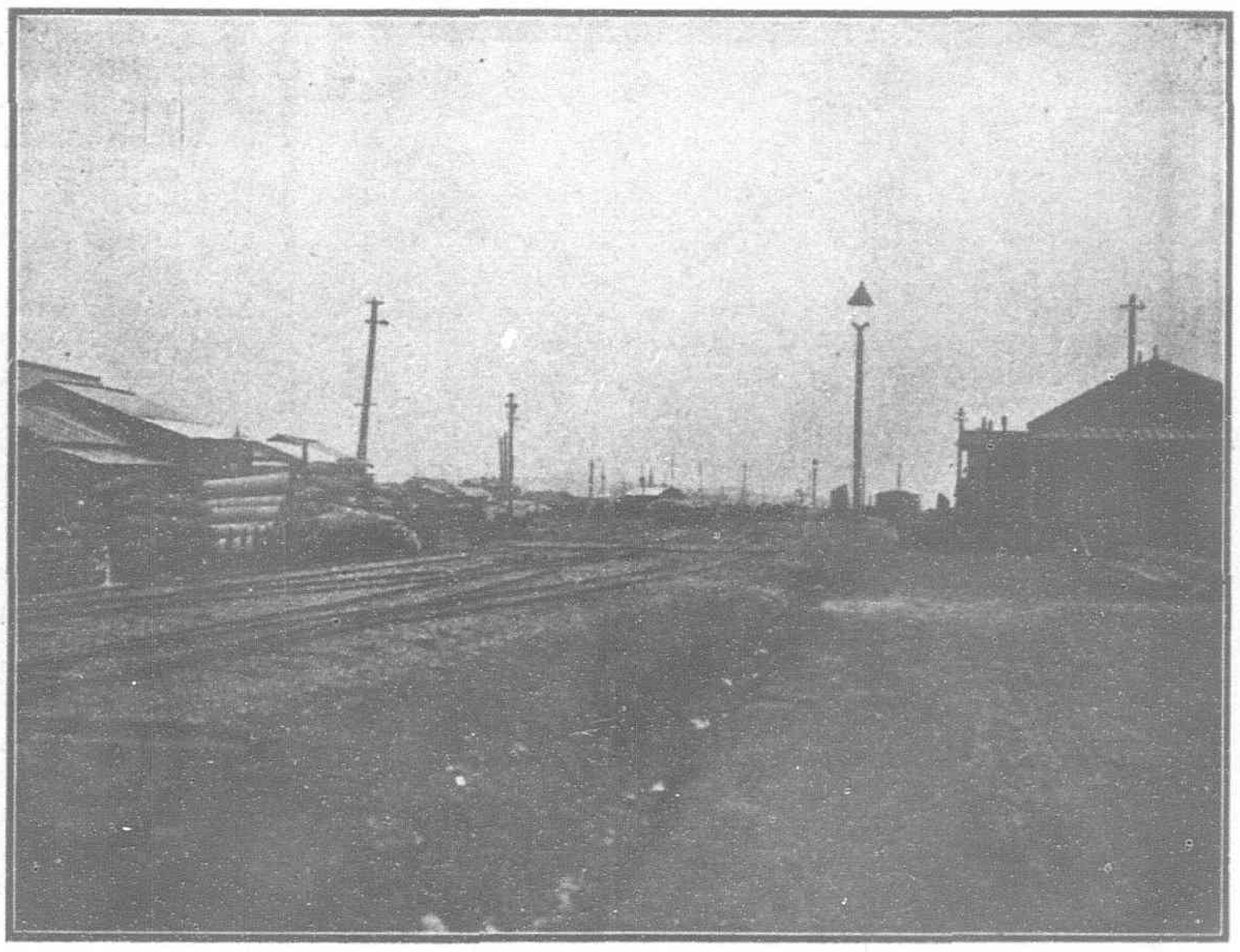
With an eye to the future availability of the line for similar strategic purposes and to make it efficient for the development of the territory and legitimate commercial uses, the Japanese Minister at Peking had inserted in the Supplementary Agreement to the Manchurian Convention of Peking of 1905 a clause to the effect that Japan not only had the right to maintain the line as a military railway, but the right to improve it and transform it into a commercial line. To make the line effective and useful as a connecting link in the through system the conversion of the narrow gauge to standard was the first requisite, and this in turn demanded the



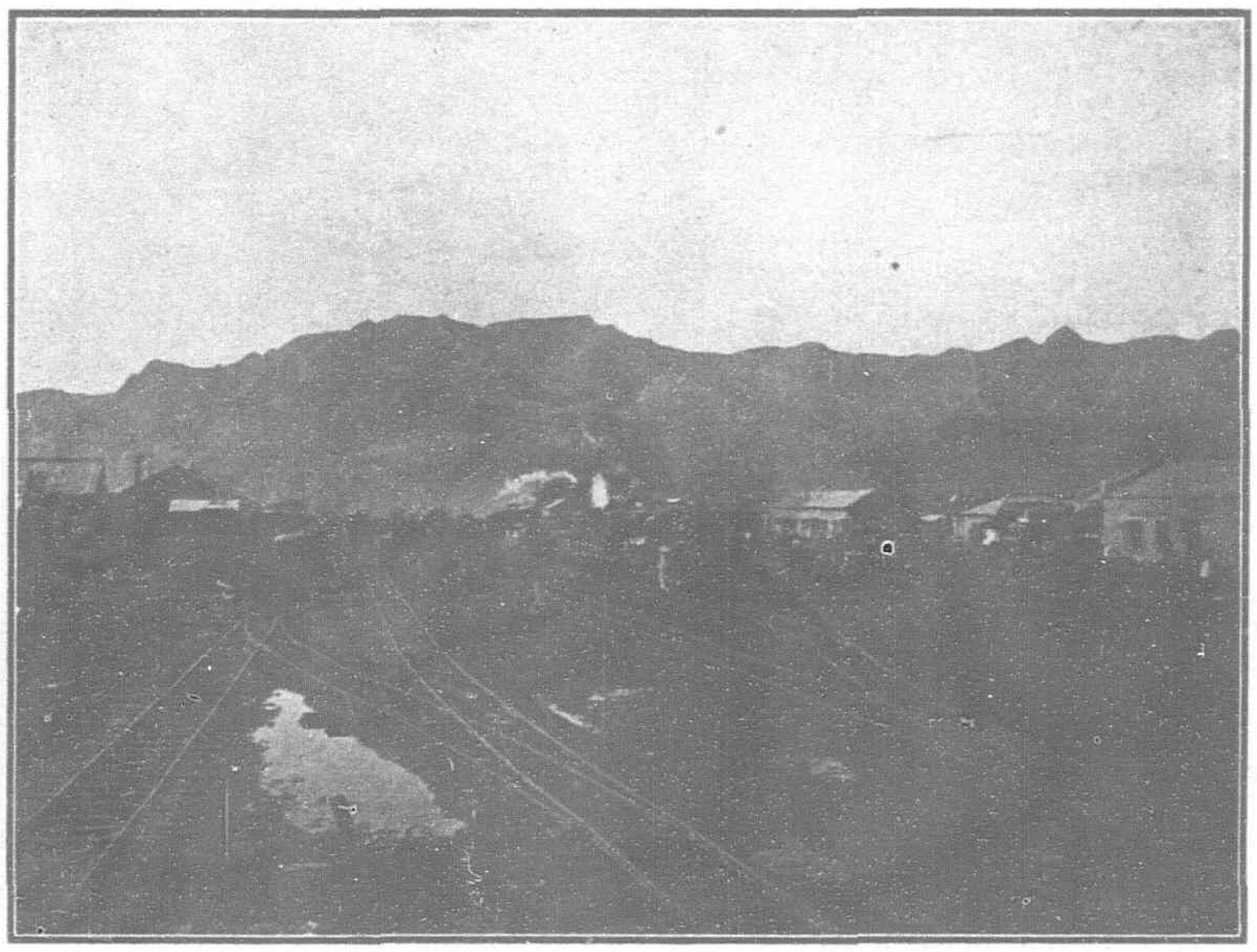
ANTUNG-MUKDEN RAILWAY: BLACK MINE PASS

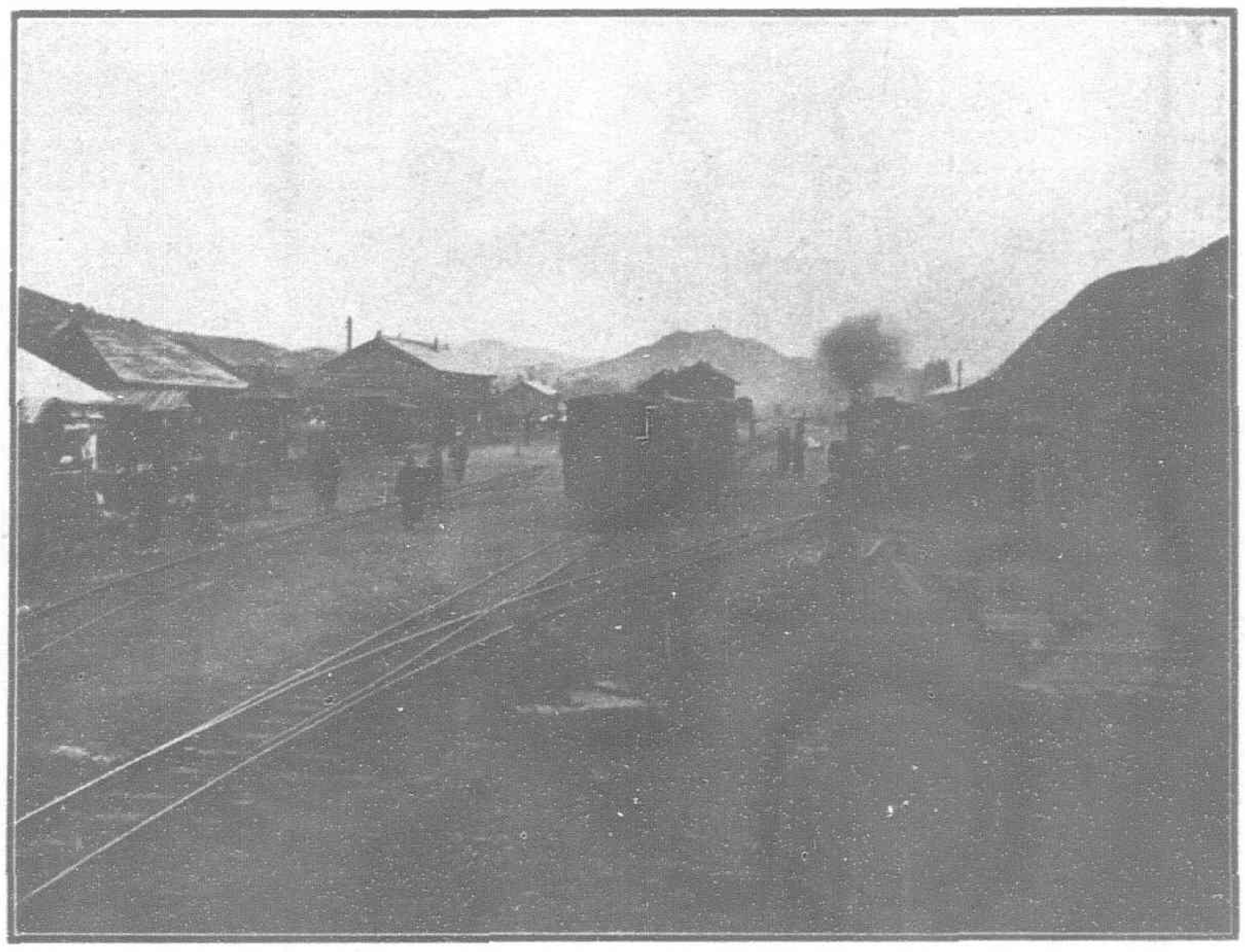


ANTUNG STATION

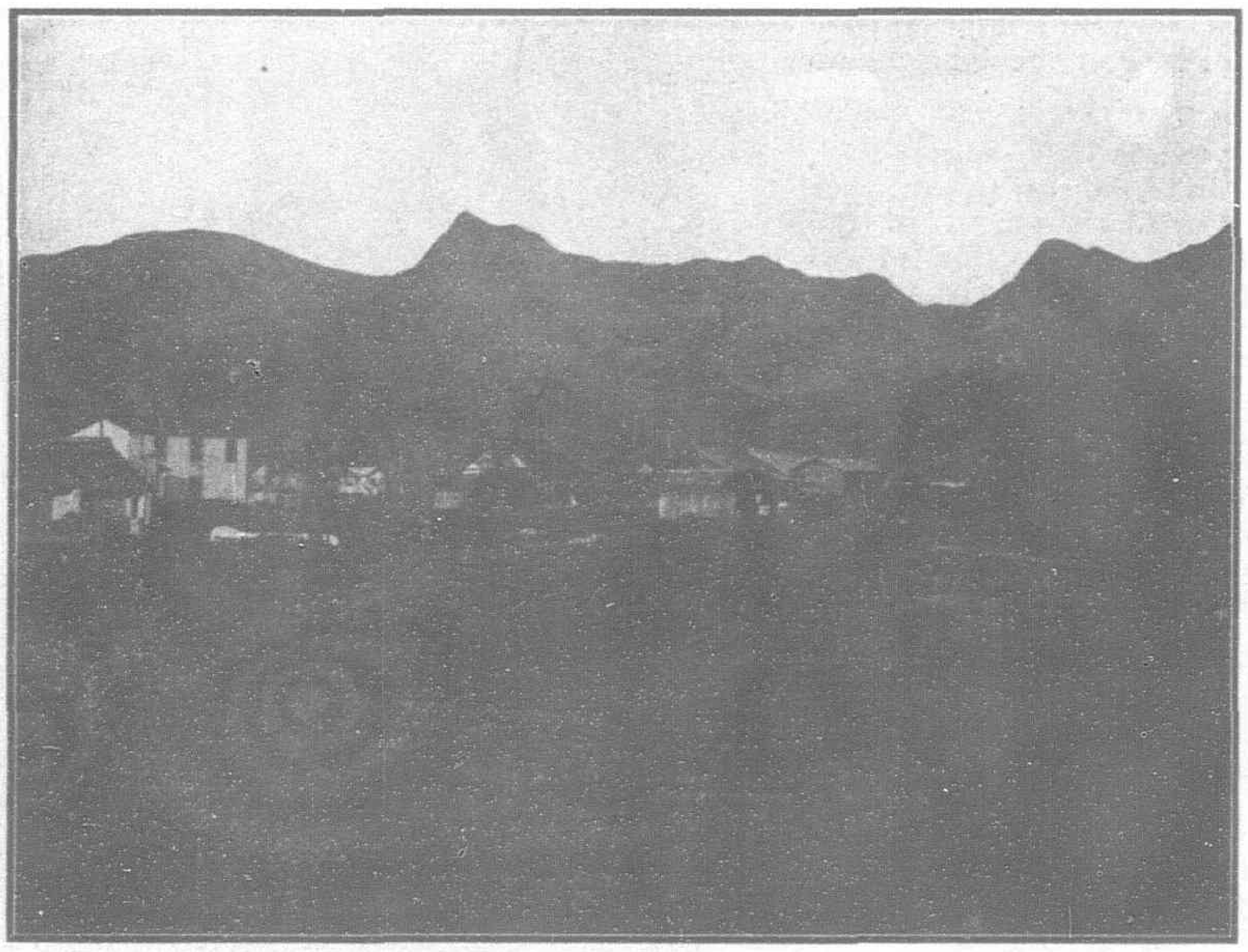


ANTUNG STATION



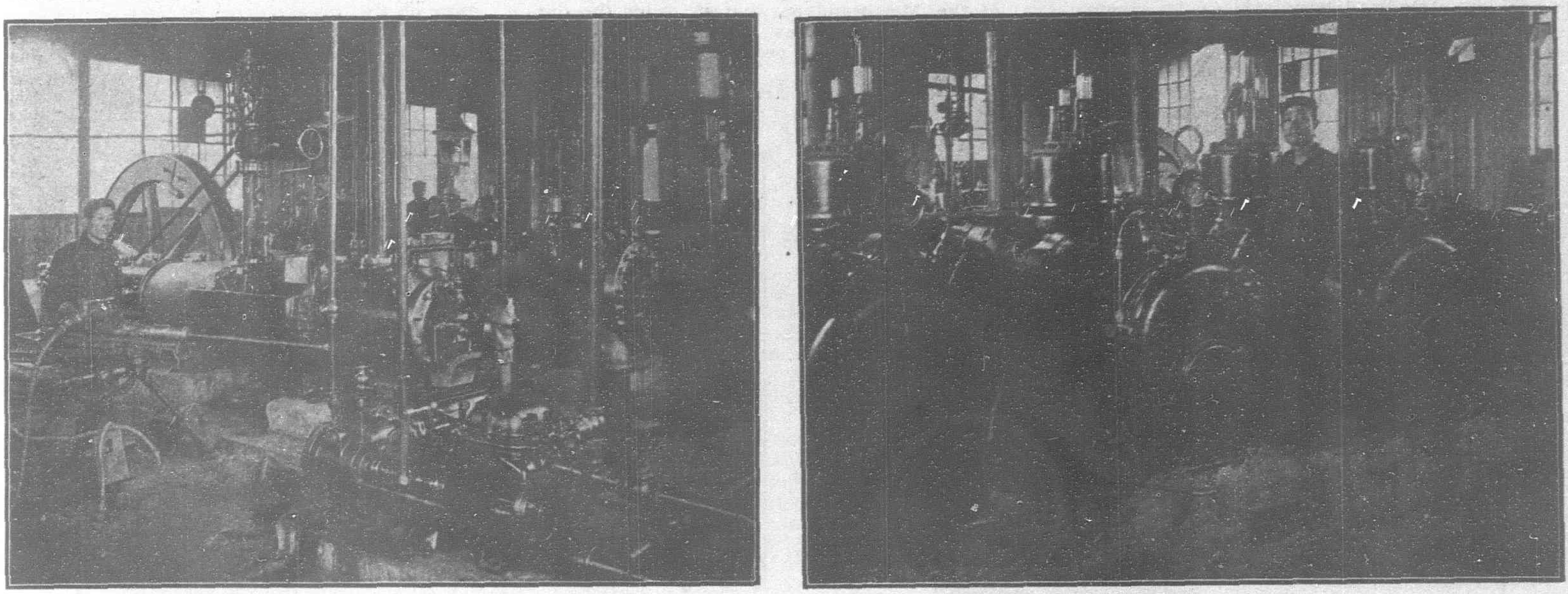


STATION AT CHIKUANSHAN



PENCHIHU STATION

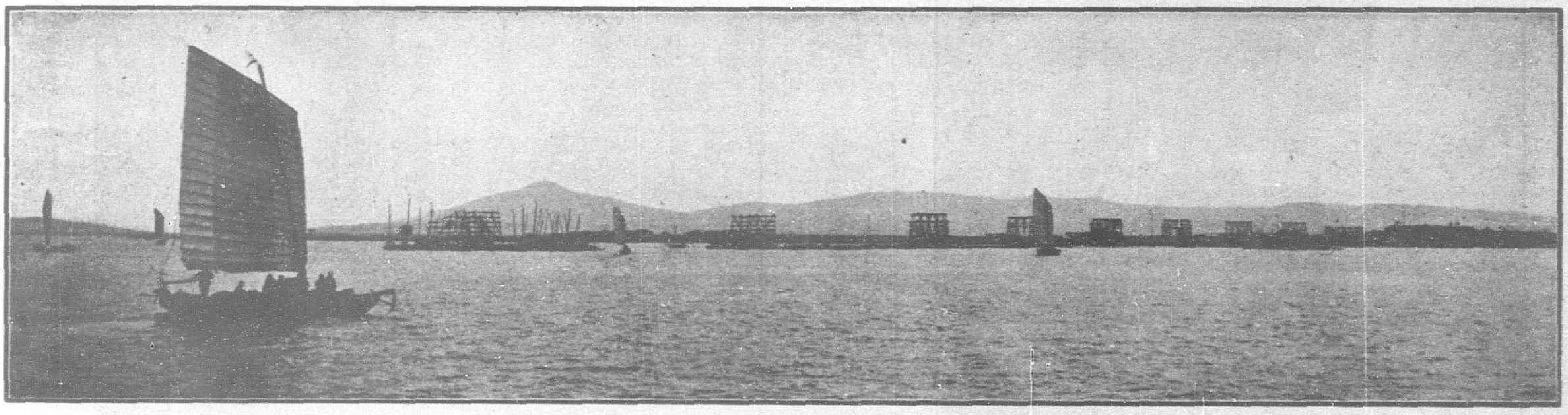
VIEW OF TSAOHOKOU. THIS TOWN IS LOCATED MIDWAY BETWEEN MUKDEN AND ANTUNG



INGESOLL RAND COMPRESSOR PLANT AT FUCHINLING TUNNEL

building of new bridges, the boring of tunnels, the straightening and grading the line, and other improvements without which its value for commercial purposes would remain nil.

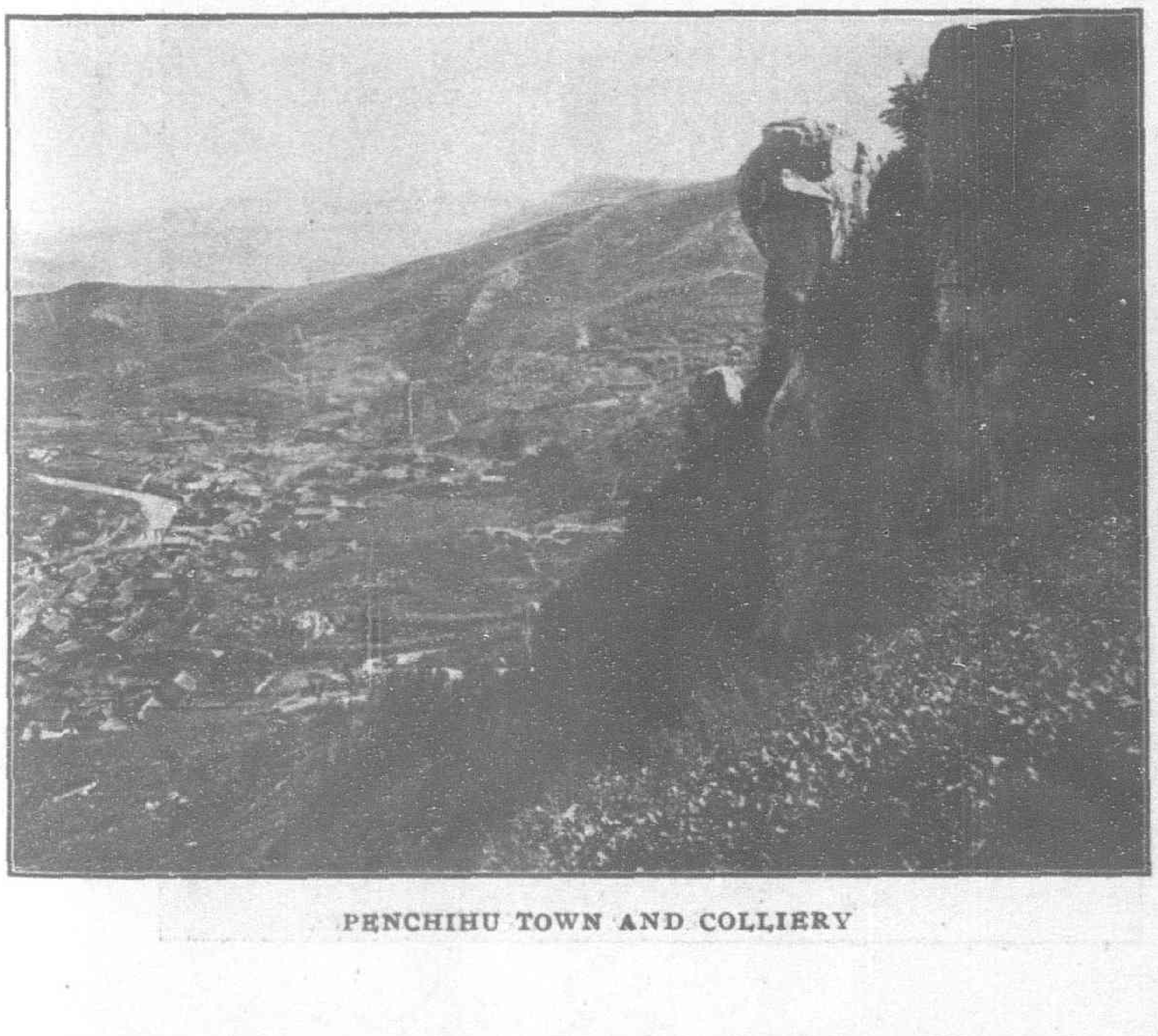
The Pekin Agreement of 1905 stipulated that the work of reconstruction should be commenced within a period of two years but Japan failed to avail herself of the opportunity within the time limit. The sudden activity of Russia, however, in deciding to construct the Amur Railway and double track the Trans-Siberian line together with other unmistakable signs of her determination to strengthen her position East of Baikal as the first move in regaining her lost ground, stirred the Japanese Government into a sudden realization of the danger of further delay in reconstructing the Antung-Mukden line.



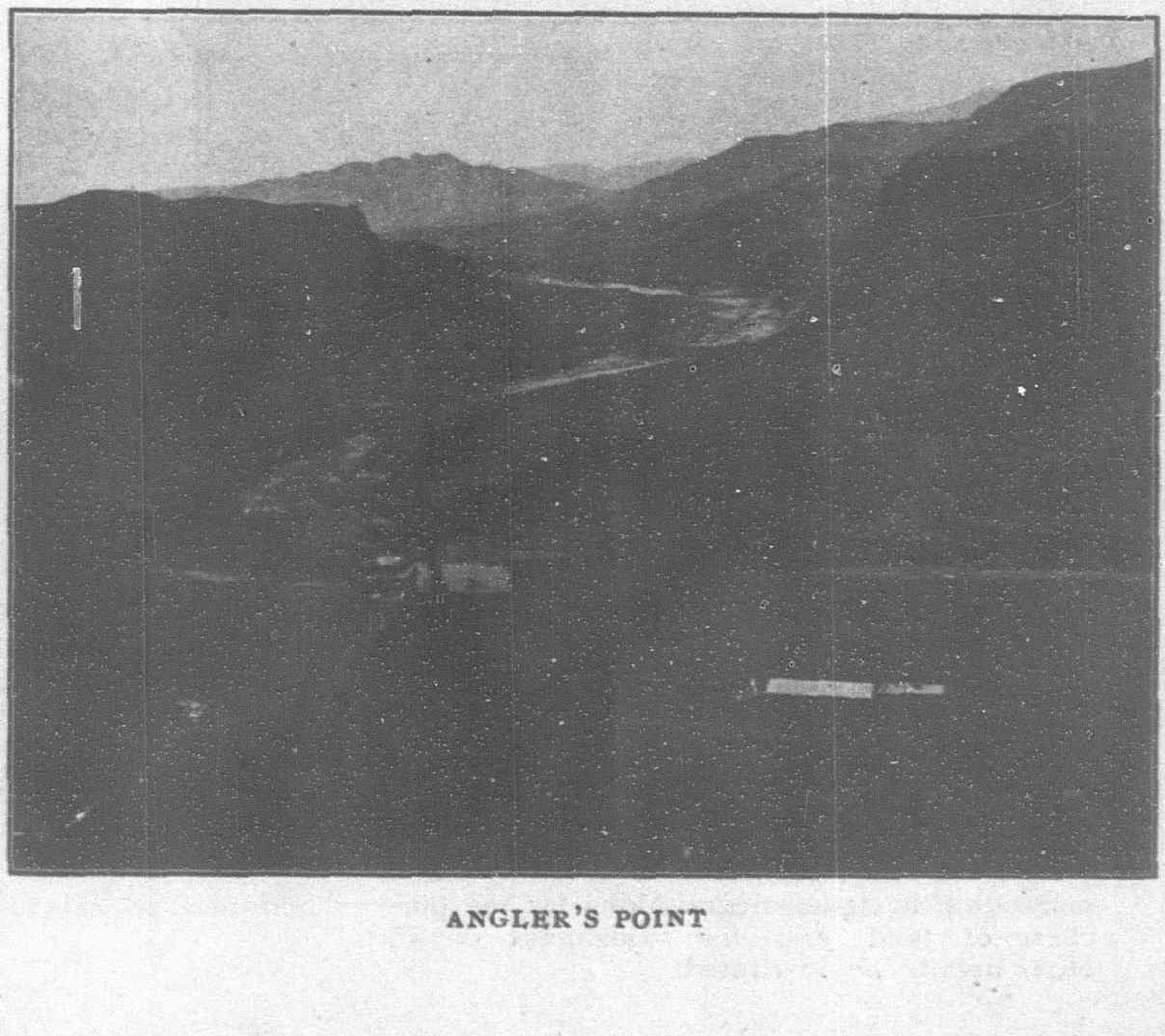
ERECTING PIERS FOR THE YALU RIVER BRIDGE

By this time, however, the Chinese Government, with the hope of regaining control over the line, raised various questions which for a time threatened to bring about a disruption of friendly relations with Japan. China finally advanced the argument that the work of improvement must be confined to the existing tract and no broadening of the gauge could be permitted. She revived several other immaterial issues which if concurred in by Japan would have nullified the provisions of the Peking Agreement and made impossible the use of the line as a commercial carrier.

The Japanese Government in the face of this uncompromising attitude, after a final attempt to induce China to reconsider her position, suddenly announced that it would take independent action and proceed to the reconstruction of the line in accordance with



PENCHIHU TOWN AND COLLIERY

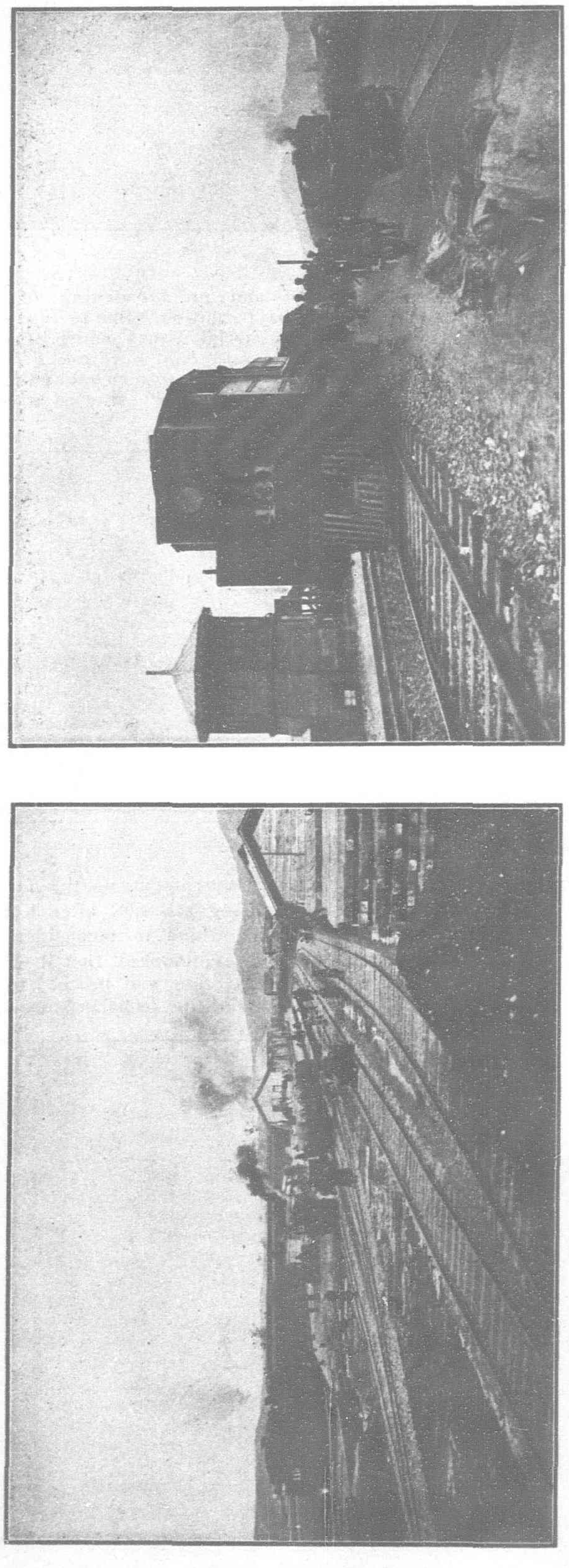


ANGLER'S POINT

her treaty rights and in harmony with the survey already determined on by commissioners of both Governments. Thereupon the Chinese Government, realizing that further obstruction was dangerous, authorized the Manchurian Viceroy to sign the following memorandum on the 19th of August 1909.

I.—The same gauge as that of the Peking-Mukden Railway shall be adopted.

II.—Both Japan and China shall recognize and approve of the whole line as already surveyed and agreed to by the Commissioner of the two Governments. But the location of that portion of the line from Chenhsiangtun to Mukden shall remain to be decided by mutual conference between the two countries.



JUNCTION WITH THE SOUTH MANCHURIA RAILWAY

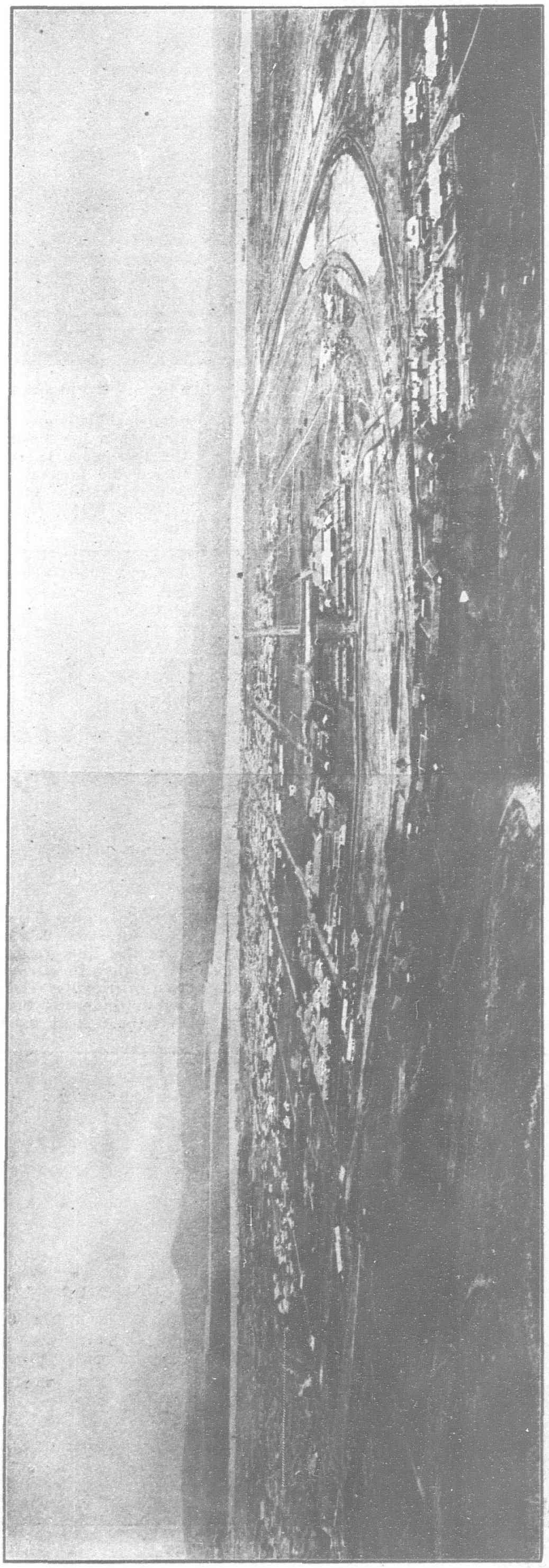
III.—On and from the date when the Memorandum is signed negotiations for the purchase of land and for adjustment of all other details be instituted.

IV.—From the day following the signing of the Memorandum, that is, from the day after the negotiations above mentioned, the instituted work of reconstruction shall be accelerated.

V.—China shall instruct local officials along the line to give every facility regarding execution of the works.

Under the new Agreement work on the line was initiated shortly afterwards and has been pushed ahead in a manner highly credit-

(Continued to page 20.)



VIEW OF ANTUNG, SHOWING THE JAPANESE CONCESSION AND YALU RIVER IN DISTANCE

THE FAR EASTERN REVIEW

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THE HU-KUANG LOAN

When the principle of the "Open Door" in the matter of purchase of foreign railway materials, was first advocated by the FAR EASTERN REVIEW, in connection with foreign loan agreements it was not very warmly received in certain interested quarters, but the spirit of fair play involved, gradually appealed to the different groups interested in China's railway finance until it was finally accepted as the only reasonable adjustment of the usual conflict of the different foreign interests when any one nationality attempted to conclude a loan on the old basis. With the conclusion of the Hu-Kuang Loan, May 20, the principle was fully recognized by the four powers interested, viz, Britain, Germany, France, and America, which practically assures its incorporation in all future agreements.

This special clause in the Hu-Kuang Loan Agreement provides that the British and China Corporation and the Deutsche-Asiatische Bank will receive a commission of 5% for all foreign materials purchased only; that Chinese materials shall be utilized whenever available and specifically provides that the rails shall be purchased from the Hangyang Iron Works; that foreign materials necessary be purchased in the open market and under equal conditions as to quality and price, preference will be given to the manufactures of Britain; Germany, France and America; that if Chinese goods are offered in competition to the manufactures of the four nations named, all conditions being equal, Chinese material is to be given the preference.

In concluding a comprehensive review of the terms of the Hu-kuang Loan, the *Peking Daily News* directs attention to the improvement therein with respect to purchase of material as compared with former agreements and says:

"Though the agreement still bears features of the ordinary previous loans in the matters of the control of finance, the appointment of foreign engineers and the purchase of foreign materials, yet thanks to the editor of the FAR EASTERN REVIEW who first advocated the principle of equal opportunity to the goods of all nations to supply the wants of Chinese Railways there is to be found in the present agreement a decided improvement upon the old ones, the provision for giving railway materials of the world an equal opportunity to compete in the Chinese market".

The loan is for £6,000 000 drawing interest at 5% for a maximum term of 40 years but redeemable after ten years at a premium of two and one-half per cent and after seventeen years at par. If additional funds are required the agreement provides for an additional loan of £4,000,000 on the same terms.

China is to receive 95 per cent of the face value of the bonds and the amount deposited in the banks, other than in China, is to earn interest at the rate of 3% per annum the rate on deposits in banks in China to be later decided.

The proceeds are to be utilized in redeeming the American-China Development bonds outstanding to the face value of £500 000 at 2½% premium; to complete the Hupeh-Hunan section of the Canton-Hankow Railway, 600 miles, and the construction of the Hankow-Szechuan Railway, 700 miles, a total of approximately 1300 miles of line. The loan is secured by liens upon Hupeh likin and salt taxes and Hunan imported rice tax, general likin and salt taxes.

Provision is made for a British engineer-in-chief on the Canton-Hankow, a German on the section of the Hankow-Szechuan line to Tchang and an American on the Tchang-Kweichou section.

The agreement also provides for auditors to supervise the expenditures. The director general will be Chinese and the appointments of foreign engineers-in-chief will be made by the Chinese Government subject to the approval of the representatives of the financial interests.

The last word on this loan is the news from London that the issue was oversubscribed at a 101⅛ which indicates the favorable attitude of foreign investors to Chinese loans even involving the most liberal terms yet arranged.

THE NATIONALIZATION OF CHINESE RAILWAYS

It would seem that with the organization of the council-cabinet, China had inaugurated an active federal policy designed to strengthen the central government and bring order out of chaos. The most important edict issued in many years provides for the nationalization of the trunk lines of the Chinese empire and including them in one comprehensive system.

As the decree states, to control the defence effectively, the only means is the speedy construction of the railways. "After careful and repeated deliberations, the nation must possess a complete system of trunk lines to and from the four quarters of her territory in order to administer the government by a grasp on the central pivot." The decree proceeds to review the history of Chinese railways pointing out the unsatisfactory results obtained especially in Kuangtung, Hunan, Hupeh, and Szechuen where the decree declares: "the offices have been open for a number of years, only wasting money by inactivity. Thus in exhausting the fat of millions of our people, we find only waste and extravagance in some cases, and misappropriation and pocketing in others, so that it is feared the longer that time passes, the heavier will be the burden of the people, high and low will suffer from its effects, the consequences of which are beyond our present imagination. Therefore, we desire to proclaim explicitly to the world that all the trunk railways shall be State owned, this shall be the fixed policy. Whatever trunk railways in the provinces which were under private management by companies established before the third year of Hsuan Tung, have been delayed in construction long enough, they shall immediately be taken over by the Government as State owned, and their building work shall be pushed on with energy. With the exception of the branch railways which shall be continually allowed to be undertaken by the people according to their ability, all cases of trunk railways formerly granted shall be cancelled. With regard to the details in the manner of taking them over, let the Ministers of Finance and of Posts and Communications gravely obey this Decree, and devote their whole attention to devising the fulfilment of it. They shall then, as soon as possible, request our order before execution. The Ministers in control shall not feel hesitation or fear, in preventing matters going from bad to worse. If there be anyone, who intentionally disturbs the railway policy regardless of the public welfare, creates doubts and incites resistance, he shall be summarily dealt with in accordance with the penalty for disobedience to law. Let this be promulgated and made known to all."

Tuan Fang was appointed director general of the Canton-Hankow and Szechuan-Hankow trunk lines in connection with the carrying out of the nationalization decree and all the officials of the provinces and of the railways were instructed to facilitate the transfer. To offset any local manipulation of local shares an Imperial order was issued prohibiting the sale of railway shares in these three provinces and the Viceroys and Governors where directed to assume responsibility for the maintenance of order and the protection of officials engaged in the nationalizing of these lines and the carrying out of the construction program. As was expected there has been the usual opposition in these three provinces, but realization of the firm purpose of the government to carry out its railway policy is having very desirable effect.

It is understood that provision will be made whereby the provincial companies may undertake the construction of branch lines and if sincere they will find plenty of opportunity to expend their energy with good results. This proposal seems to appeal to some of the leaders previously opposed to any interference and it is to be hoped that by the time the trunk lines are completed, the mileage in branch lines constructed in this manner will be considerable.

PHILIPPINE GOVERNMENT'S FRIENDLY ATTITUDE TOWARDS CAPITAL

In our issue of February, 1911, certain references were made in an article appearing under the caption "American Capital in the Philippines" that might be construed as an unjust charge that the Philippine Government was discouraging outside capital. Nothing could be more untrue and misleading as all who have made investments in the islands or who have even expressed interest, can testify. Indeed, the most desirable feature of the policy of the Government is the continued encouragement of outside capital in the development of insular enterprises. Every means is exhausted in making investment as attractive as possible. It might also be said that the success realized in interesting capital in insular ventures is due almost entirely to the active policy and initiative of the Philippine Government.

We regret that such a misconception of the real attitude of the Government should have evolved from the article referred to, for the reason that it is not in accord with the facts, nor has any such conclusion our editorial endorsement.

The attitude of capital towards Philippine investments is slowly changing for the better as more general, reliable information respecting the favorable natural conditions and opportunities for legitimate enterprise in the development of uncovered wealth and latent industries are realized. When it is remembered that with the conclusion of the Treaty of Paris the American government undertook to administer the islands as a trust of an entirely new and altruistic character, with the disadvantages of inexperience in this line of governmental endeavor, with every industry almost at a standstill, the unsanitary conditions inviting the ravages of epidemics, and the unsettled political conditions retarding the confidential relations between the American government and the Filipinos, there now prevails a measure of participation in prosperity by all the people of the islands that is astounding. Today, no section of the Orient offers a more desirable field for the exercise of constructive ability of a high order in every department of industry than the Philippines and it is gratifying to learn that this is being realized in the centers of wealth and industrial activity throughout the United States.

American capital is always wary about invading unknown fields until convinced that enterprise affords substantial returns; that it will be accorded protection; that the labor supply is adequate and of a reliable character. It has taken many years for the Philippines to convince the outside world that all these requirements are fully met by insular conditions, and the most convincing proofs are those afforded by the experience of every American enterprise in the archipelago that has been directed by men who have adapted themselves to local conditions and whose relations with the native population have inspired confidence and respect in their integrity.

It is but natural that the casual, unthinking, western transient in the Orient is inclined to belittle the Malay laborer. He is usually compared unfavorably with the Chinese, and to substantiate it they point to the wonderful accomplishment resulting from the importation of Chinese labor, say for instance into the Federated Malay States. Indeed recently the FAR EASTERN REVIEW careful as it is of its editorial position, as a result of the presentation of a preponderance of apparently irrefutable evidence, took occasion to give expression to sentiments denouncing the Malay as a laborer to which such strong, and since proven well founded, objection was taken by Philippine labor authorities that we decided to make a more thorough investigation. We are now glad to revise our judgment of the Malay laborer and to take pleasure in doing justice to an element of the Philippine population that has suffered for centuries through no fault of its own, but with a remarkable appreciation of more liberal conditions of employment in the form of increased means of securing the comforts of life, better treatment, and a larger measure of personal independence, the Philippine laborer has more than demonstrated his capacity as a producer under proper encouragement and supervision.

This was not true of him in 1898. It may not be true of him even to this day in Malaysia. He secured little of the fruits of his efforts. He was the real "man with the hoe". It was to the interest of his masters to keep him alive, and in the centuries of peonage he was naturally reduced to that condition where there was no incentive to increased effort. He worked simply to secure the simple necessities of life and nature in its liberality relieved him of a large measure of dependence on his inconsiderate masters for his wants had been reduced to the simplest form.

But the Philippine Government did not accept the theory that the "Malay Won't Work", as did the foreigner in Malaysia. It proceeded along different lines. It investigated the conditions under which the Malay laborer lived; discouraged peonage and in every department of governmental activity gave him a fair wage, kind treatment and encouragement. At first this liberal policy was looked upon with suspicion. It was unheard of among the laborers that they should receive money direct from their employer and such a substantial sum that they would have something left over for comforts after supplying their simple wants. Then there was the opposition of the old masters to whom the ignorant mind, trained by centuries of submission, turned naturally for counsel. The motive of the masters 'attitude is obvious. Instead of remaining a serf whose labor cost little or nothing there was danger of the laborer becoming a real live entity that would have to be accounted for in calculating profits. This governmental interference was to the jefes an unheard of outrage. All over the islands the howl went up. But the administration never faltered. It continued to pay reasonable wages in its different departments of activity and as the years passed, an adjustment of private enterprises followed. The old masters discovered that the well paid laborer was a better investment than the half starved peon. The laborer slowly realized that increased effort brought larger returns in the comforts of life, the average production increased, industries received an impetus and communities gradually took on a general appearance of prosperity.

It is very true that for several years, the sudden change had the effect of making the old peon unreliable. He had so much wealth after a few pay days and such simple wants, that he did not have to work all the time any more. But this did not last. He soon realized that the extra wage placed comforts within the reach of himself and his family. When he reached this point, the Malay laborer of the Philippines became ambitious. He made his aim in life to push his name along towards the top of the payroll. Today, the Filipino laborer is doing his share. He is reliable. Once adapted to his surroundings, familiar with his work and accorded the consideration due the producer he is now recognized as equal to, if not more desirable, than outside labor.

This is certified to by the Philippine Railway Company, the Manila Electric Railway Co, the Atlantic Gulf and Pacific Company, the Batan Coal Mines, the Director of the Bureau of Public Works, the Insular Lumber Company, The Cadwalladers-Gibson Lumber Co, Derham Bros, and many more of the leading successful private undertakings in the islands.

When we said in our February issue that "the British and Dutch forgot a century ago—that the Malay won't work" we were reflecting the general attitude towards him in Netherlands India and Malaysia, but we are now convinced that we were wide of the mark when we applied this reference to labor conditions in the Philippines. The Dutch and the British might also have occasion to revise their opinions of the Malay laborer were they to give him the same chance to make good in Malaysia as he has been given in the Philippines. Had Americans generally accepted him at his face value as they found him, as unfortunately some of them did, and had left him a starving peon without the strength or inclination to develop his producing powers-we might today be justified in agreeing with our Dutch and British friends. But, very fortunately, we have taken the opposite course with most encouraging and remarkable results.

This was no easy task for the Administration nor the private interests. In the first few years of occupation under unsettled conditions, with the peonage system widespread and effective in its control of labor, the inexperienced westerner, anxious to hurry the east, ignorant of the system that controlled labor, and impatient of results, loudly denounced the Philippine laborer and clamored for Chinese. This conception of the laborer was naturally spread broadcast and was accepted without investigation. It was supported by the sentiment prevailing in Malaysia. Unfortunately slander spreads more rapidly than its retraction and notwithstanding the fact that these same westerners, after the exercise of patient investigation, followed by an adjustment of methods to undermine the peonage system, had been forced to revised their judgment to an appreciation of the labor under changed conditions, rarely took the pains to give expression to their changed attitude. This has not only proven unjust to Philippine labor but has misled investors on this important requirement.

We are unconvinced that Filipino labor has yet reached its highest capacity for production, but we have the unequivocal convincing testimony of the heads of the large firms referred to above, that the Filipino laborer has proven in every case equal to, and in many cases is preferred to the Chinese laborer.

The administration, notwithstanding any doubts to the contrary, has been most consistent in living up to the policy originally outlined. Its purpose is to develop the islands along lines designed to give all the inhabitants participation in benefits resulting. Even those who accepted wholly the precedents in colonial exploitation having little regard for the welfare of the native inhabitants, have revised their judgment in recent years as they recognize the increasing purchasing power of the Filipinos under the administration" beneficent policy. More adequate return fos labor with increased production and export, makes for prosperity. Trade reports for the last few years show increasing purchases abroad and the internal revenue report shows annually increasing internal trade. All this bespeaks a healthy prosperity not confined to any class and justifies the course pursued by the American government.

Such conditions are an invitation to capital not duplicated in countries where the greater purpose of government is sacrificed in the interest of the few. With a population industrious, prosperous, and contented, a climate most desirable, sanitary conditions unexcelled, and with unlimited tropical wealth, no section of the world offers greater returns for capital invested in industrial enterprises wisely directed.

THE GOOD NAME OF THE MANILA CIGAR

In a recent issue of the FAR EASTERN REVIEW attention was directed to a proposed publicity campaign on the part of the Manila Tobacco Association to overcome the malicious propoganda carried on by enemies in the United States against the good name of the Philippine cigar and that has resulted in a serious falling off in export for the eleven months ended May 31, 1911 compared with the corresponding period of 1910. For eleven months ended May 1910 there were 82,000,000 cigars exported while during the corresponding period 1911 the total export was only 24,000,000. This seems sufficient reason for united and prompt action.

That the press of the United States is friendly to Manila cigar interests has been demostrated by hundreds of favorable comments by our exchanges on this article and should hearten our local manufacturers.

Typical of this attitude on the part of the American press is the comment of the *Rochester Union and Advertiser* of Rochester, New York, which we take pleasure in quoting in full as follows:

"THE FAR EASTERN REVIEW, a journal published in Manila, Shanghai and Yokohama, declares that the 'predatory tobacco trust in the United States that practically controls the distribution of cigars and the cigar situation generally throughout that country,' has for the past six months been conducting a well-organized campaign against the Manila cigar. It asserts that 'vicious misrepresentation designed to prejudice the consumer and hamper the retailer by trade duress, the weapon of the Trust when other means fail' have been made the basis of the campaign. It calls upon the newly organized Manila Tobacco Association to fight the trust.

"While we have not perceived any signs of a fight upon the Manila cigar by the tobacco trust in this country, we may believe that such a fight has been begun from the very fact that the Review, which deals with the engineering, commercial and financial life of the Far East, complains of the fight. It must surely have discovered by the effects upon the Manila trade that some such campaign as it calls attention to was being waged. That the Manila cigar has benefited by the Payne-Aldrich law, which gave it free entry to this country in limited amounts, is seen in the fact that 83,931,000 cigar were sent here in 1910, early in which fiscal year the law went into effect, as against 2,696,000 sent here in 1909. This trade surely is a prize worth contending for and the means the Review advises the Manila Association to use are commendable for their business sense.

"The Review tells the Association its best weapon is publicity. It advices it to control the export of cigars which will take from the trust one of its best weapons, the misrepresentation of cheap and inferior cigars manufactured by small Chinese factories to the American consumer as a standard Manila cigar. The Manila cigar is, of course, a good cigar and has an excellent reputation in Europe, where it has been sold largely for many years. The Association is advised to take up the publicity campaign as soon as it is thoroughly organized. The advertising propaganda is to be directed to the consumer and to the jobber and retailer. By control of the export, inferior products will not be allowed to down the good Manila cigar and the American market will not be glutted. The Review thinks the news that such an organization, with such aims, had been effected would be a bit of publicity that would be welcomed by and would hearten the friends of the Manila cigar here.

"There seems to be a characteristic trust feature to the proposed plan, in the control of the export trade. But since the Association is simply an organization of men in the same trade, it may escape downfall from this source. The publicity compaign is a sensible device. Whether there is a fight on the Manila cigars here or not, the advertising will doubtless benefit the sale of Manila cigars and the people will probably be able to test the Manila cigars. If then it is as good as claimed, it will make headway."

Following is also comment apropos of this subject by *Tobacco*:

"Everybody in the trade who studies conditions at all carefully can readily perceive a marked similarity between the mistakes made in the early attempts to market Porto Rican cigars in the United States, and the more recent efforts to make Manila cigars a factor in the business of the jobbers and retailers in this country.

"The Porto Rican cigars received a tremendous black eye at the outset, and the Manila cigars have met with conditions in many ways similar and largely due to the same causes.

"The early imports of Porto Rican cigars, as the trade is well aware, were made largely through commission houses engaged primarily in other lines of business, and having little or no practical knowledge of the requirements of the cigar business, and this was to a considerable extent true of the first imports of cigars from Manila following the removal of the tariff duty by the Payne–Aldrich act.

"It is a fact that not all of the early importers of Manila goods were without experience or knowledge of the requirements of the cigar trade, but even these parties made the mistake of accepting a large percentage of the lowest grade cigars made in the Philippines.

"But the commission houses, particularly on the Pacific coast, made the greater mistake of overloading the trade with low grade Manilas, which were placed on consignment in a limited number of markets.

"After the first flush of curiosity to Manilas was over, it was found that the goods were not moving as fast as had been expected, and then came a series of offerings of job lots at heavily cut prices, which was most demoralizing to the profitable sale of the cigars from the Philippines. This brought about a situation that to a large extent paralleled that which existed in regard to the Porto Rican cigars something like a decade earlier.

"Furthermore, such advertising as was done for the Manila cigars in the columns of the trade papers was largely of a tentative and half hearted sort, in no way to be compared even for a moment with the steady, vigorous, persistent publicity campaign which was earlier conducted by a few of the leading houses in the Porto Rico cigar trade.

"Because of the intelligent and continuous campaign which was conducted in the trade papers in behalf of their product it was possible for the Porto Rican manufacturers within a comparatively short time to overcome the apathy on the part of the trade generally toward their goods, and they can now look with the utmost complacency upon the results obtained, as revealed in the fact that THE SHIPMENTS OF PORTO RICAN CIGARS TO THE MARKET OF THE UNITED STATES DURING THE FIRST FOUR MONTHS OF 1911 WILL BE CONSIDERABLY IN EXCESS OF FORTY-FIVE MILLIONS, an increase of more than five and a half millions over the corresponding months of 1910, notwithstanding the fact that serious strikes in the island for many weeks this year have tended to largely keep the shipments below the actual demand.

"The lesson for the importers of Manilas, as well as for the manufacturers in the Philippines, is so plain that he who runs may read.

"The cigar manufacturers in the Philippines must send to the United States the best cigars that it is possible for them to make, and they must back this up by a steady, continuous campaign of education through the columns of the trade press.

"They cannot expect to accomplish it all in a few weeks, or a few months, but with patience and persistence they can accomplish wonders in a year or two. The rank and file of the trade are mighty indifferent just now to the claims of the Manila cigar, and there are thousands of dealers who have never even given them a trial in their show cases —but this indifference can be overcome and the great majority of these thousands of dealers can be interested in pushing Manila cigars if those behind them will enlist in an intelligent and persistent campaign of education through the medium of the trade press."

THE RAILWAY OF JAPAN

The present railway system of Japan had its inception in 1872 when the Government constructed the line between the capital and its port at Yokohama, a distance of 18 miles. For ten years afterwards the expansion of railways in the Empire was left to official initiative, and as a consequence the rate of progress was slow, the length of roads completed in this period being only 150 miles. Up to this date (1883) private capital had refrained from embarking in railway enterprise but in that year the first private company was formed for this purpose followed by others who soon monopolized the most profitable and important trade routes. In 1687 the Private Railways Regulations were issued, which gave an added impetus to such undertakings. Private railways then took the lead and by 1907 there were 42 lines with a mileage of 3,140, while the Government lines open to traffic were only 1,344 miles. In 1900, the Private Railway and Railway Traffic Laws were promulgated which prohibited the hypothecation of railway properties and made it difficult for private companies to incur a bonded indebtedness.

To remedy this condition a Railway Mortgage Law was passed in March 1904, under which a private joint stock company might mortgage its properties for an amount not exceeding its total paid up capital.

There were certain reservations however in the various railway laws and franchises which enabled the State to secure control by purchase or otherwise whenever such a measure was deemed of national necessity, and the severe tax on the transportation facilities of the Empire during the war with Russia, convinced the Government that to carry out its post bellum policy the control of all the railways was imperative for strategic reasons, and to further its commercial program. With some 40 odd private lines, transportation arrangements lacked uniformity and entailed economic disadvantages in the expansion of the newly conceived trade policy. Accordingly the Railway Nationalization Law and the Keifu (Korean) Railway Purchase Laws were presented to the Imperial Diet and passed by that body in March 1906. This measure provided for the purchase of all main trunk lines and concentrating their management under the Ministry of Communication leaving only the small local and branch lines to be operated by private capital.

The plan originally decided on by the Government, embraced the purchase of 32 private lines, or practically every road over 2 miles in length, but the Diet excluded 15 of the shorter lines or feeders and the coal mines belonging to the Hokkaido Tanko Railway Company.

The 17 lines purchased under this Law were the Nippon, Sanyo, Kobu, Kwanasi, Kyoto, Hankaku, Hokoyetsu, Nishinari, Nanao, Ganyetsu, Kyushu, Hokkaido, Sangu, Sobu, Boso and the Tokushima, all main trunk lines, with an aggregate length of 2 812 miles, and charged with a cost of construction of about Y229.000,000 (£23,463,115) or a rough average of £8,000 or $40,000 goldper mile.

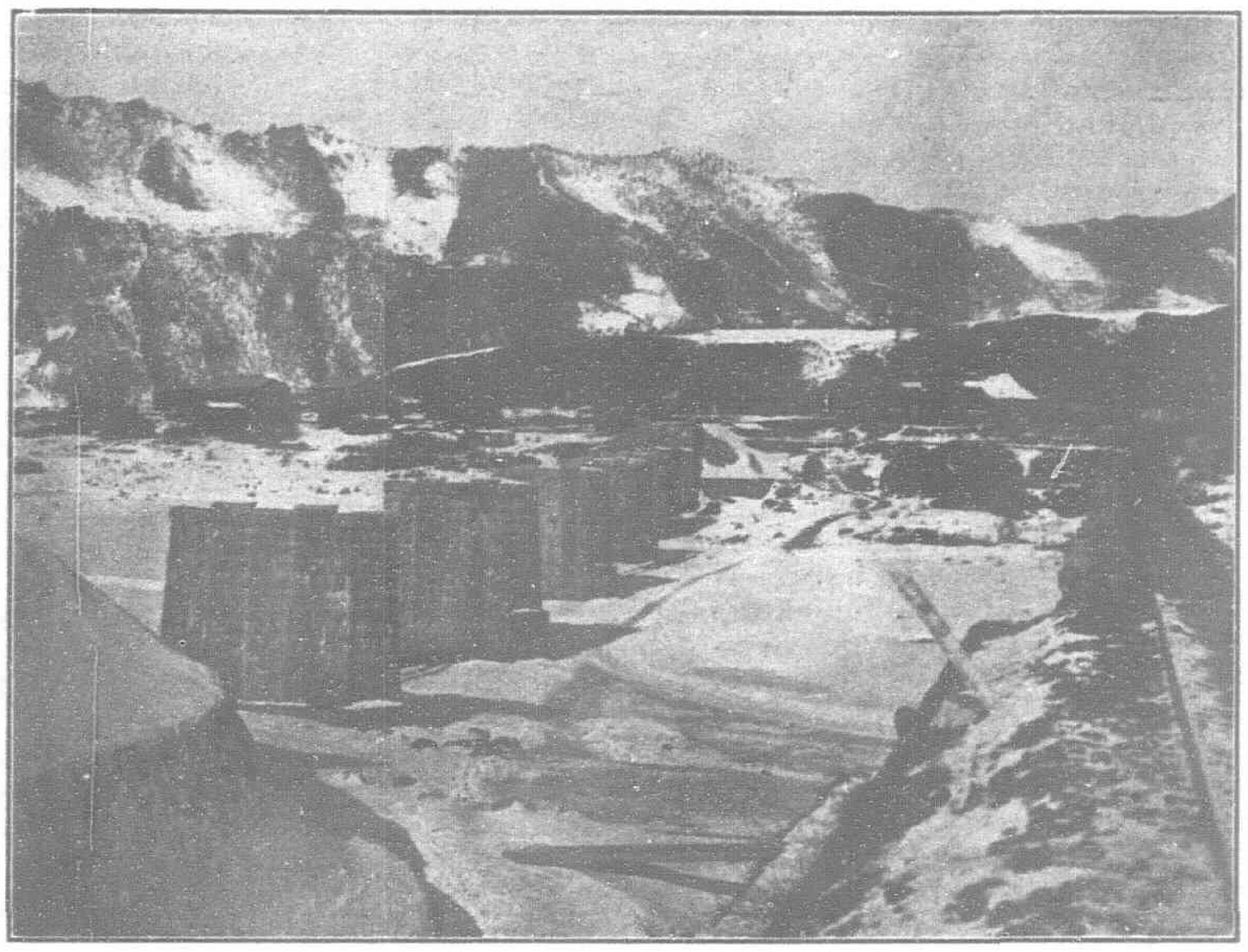
The Law provided for the purchase of the 17 lines within a period of ten years from 1906 to 1915, the purchase money to be delivered within five years from the date of purchase in public loan bonds bearing five per cent interest calculated at their nominal value: from the day of purchase until the day on which the bonds are delivered the Company so bought out were to receive semi-annually five per cent per annum on the purchase price.

The price was determined by first ascertaining the average rate of profit against the cost of construction during the last six semi-annual terms. Twenty times that rate multiplied to the cost of construction was set as the purchase price, plus the value of supplies existing at the time of purchase. In the event of the cost of construction being under the purchase price so determined, that cost was made the purchasing price.

This arrangement was employed for such new lines which had had not yet been operating for the six specified semi-annual terms.

The total amount of public loan bonds delivered under the provisions of the Railway Nationalization Law as purchase money to private railway companies was Yen 476,318,800 (£48,788,159). Of this sum the bonds paid up to the 31st May, 1909, were of the following amounts:—for the Keifu (Seoul-Fusan) Railway, Yen 20,123,800 (£2,061,231); for the Hokkaido Tanko (Colliery) Railway, Yen 30,997,100 (£3,174.957); for Kobu Railway, Yen 14,599,550 (£1,495,396); for the Japan Railway, Yen 142,523,600 (£14,598,341); for the Ganyetsu Railway, yen 2,422,000 (£248,079); for the Nishinari Railway, yen 1,846,900 (£189,173); for the Sanyo Railway, yen 76,639,200 (£7,849,964); for the Hankaku Railway, yen 273,650 (£28,029); for the Sobu Railway, yen 150,000 (£15,364); for the Nanao Railway, yen 100,000 (£10,243); and for the Tokushima Railway, yen 100,000 (£10,243); total, yen 289,775,800 (£29,681,020).

While the Government had the option of completing the purchase of the lines within the period of ten years by paying the companies the 5% interest on the purchase price in lieu of their customary dividends, it was found more economical to float the entire issue at once, and the remaining balance of yen 186,543,000 was paid by the end of July 1909 in the following proportions. For the Hokkaido Railway, yen 6,131,500 (£628,034); for the Kyushu Railway, yen 118,508,150 (£12,138,497); for the Hokuyetsu Railway, yen 3,721,800 (£381,215); for the Kyoto Railway, yen 3,296,400 (£337,641); for the Boso Railway, yen 960,400 (£98,371); for the Kwansai Railway, yen 30,437,550 (£3,117,643); for the Sangu Railway, yen 5,728,950 (£586,802); for the Hankaku Railway, yen 4,010,700 (£410,806); for the Sobu Railway, yen 12,256,050 (£1,255,357); for the Nanao Railway, yen 894,300 (£91,601); and for the Tokushima Railway, yen 597,200 (£61,170).



BRIDGE NO 5 UNDER CONSTRUCTION OVER HSIHO—(FEB. 1911.)

The total mileage of the private lines on the day of purchase was 2,823 miles, and the total amount of loan bonds delivered to the companies as purchase price was Y 476,318,000 (£48,788,159) at an average of Y 168,000 ($84,000) per mile. It was feared that the issue of such an enormous amount of bonds in one year would naturally lower their market value but, owing to the solid financial condition of the railways, a steady rise in value has been witnessed instead.

The purchase bonds were taken up as a domestic loan, and bear five per cent interest. The principal of the loan remains unpaid for the period of five years from the time of issue (1913) and is to be fully redeemed within fifty years (1963) from the profits of the railways. Provision has been made for the retirement of these 5% bonds and their substitution by four per cent bonds, to enable the Railway department to effect a saving so as to pay the interest on additional loans for future improvements and extensions.

Before the nationalization scheme was effected, funds for the Government railways were appropriated from the general account of the Treasury, but with the absorption of the 17 private lines and the creation of the large bonded indebtedness, a special law was enacted in 1909 placing the finance of the State Railways entirely independent of the General Budget and accounts.

Under this law the Imperial Railway capital and funds for materials and all moneys to be hereafter invested are made the capital of the railways and a special account established by applying the annual revenue therefrom to the annual expenditure. The expenditures required for the construction and improvement of railways are defrayed out of the railway profit; and in case of a deficit in the railway profit, the Govern-

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THE ANTUNG—MUKDEN RAILWAY

(Continued from Page 16.)

(1) Land—Right of way, 6,210,000 "tsubo".

(2) Total volume of Earthwork involved, 1,384,000 cubic tsubo. The portion already completed, 990,000 cubic tsubo.

(3) Bridges—Total number, 218; aggregate length, 21,180 ft.; the longest bridge is the one across the Taitzu with a length of, 1,900 ft,

(4) Culverts—Total number, 213; length of open culverts, 1,510 ft; length of arch culverts, 2,098 ft.

(5) Temporary wooden bridges (between Antung and Chikuanshan)—Total number, 67; aggregate length, 4,210 ft.

Note: (1) A "tsubo" is equal to 86 qs. ft. (2) A cubic "tsubo" is equal to 216 cub ft.

(6) Tunnels—Total number, 25; aggregate length, 26,540 ft. The four main tunnels are:—

	Length	Heading completed
Fuchinling	4,884 ft.	3,800 ft.
Chikuanshan	3,284 "	2,770 "
Fenshuiling	1,914 "	Complete
Heikengling	1,505 "	Complete

Heading has been drilled in the case of the other 21 tunnels.

(7) Railway line—Length of main line, 170 miles (including 8 mile section between Fuan and Mukden); length of sidings, 35.5 miles Total track length, 205.5 miles; the 38 mile section from Fuan to Penchihu and the 53 mile section from Antung to Chikuanshan was opened to standard guage traffic, the former on January 15 this year and the latter on November 3 last year.

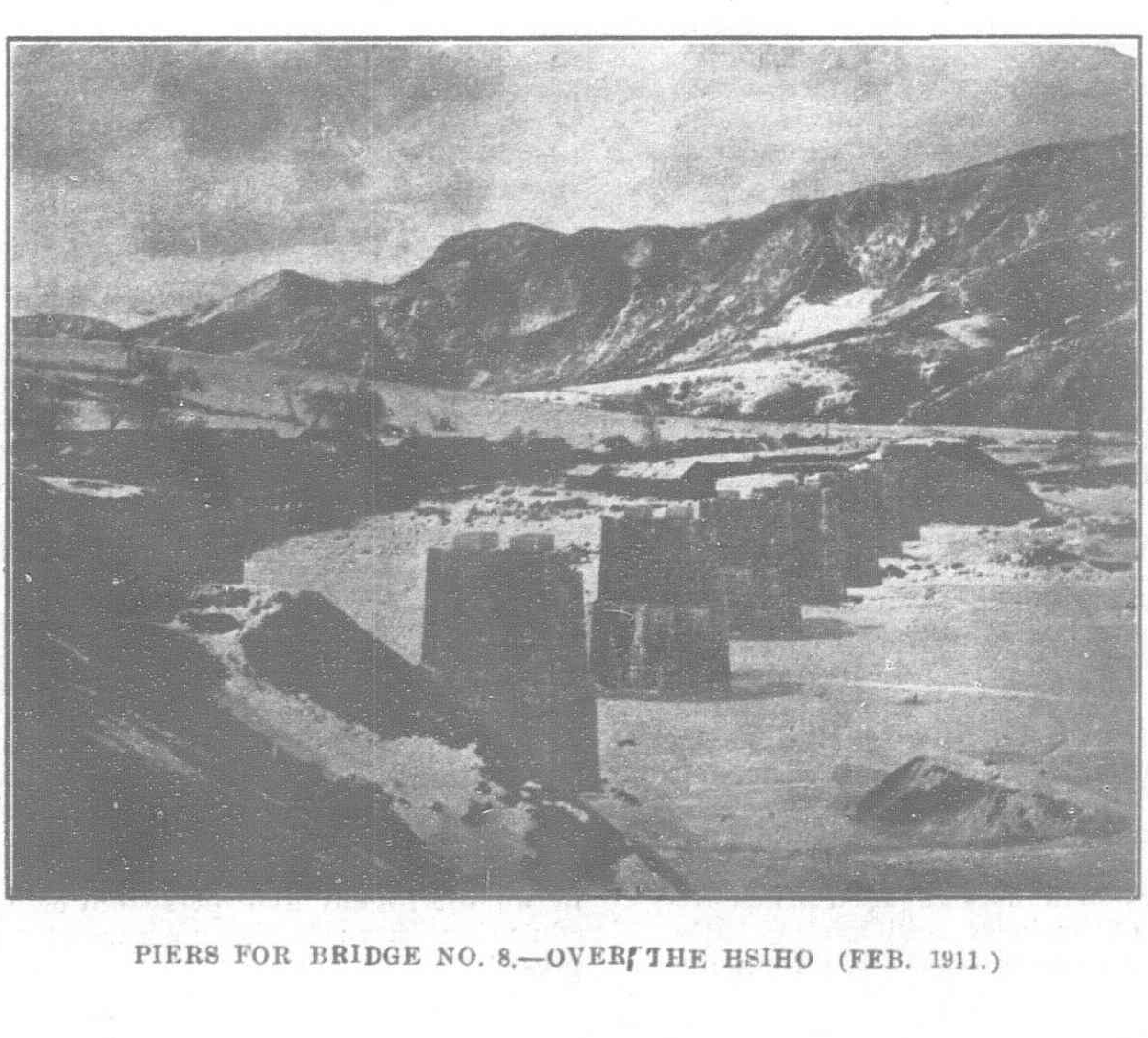
(8) Stations—The number of stations, 25.

(9) Coolies and labourers—The working force now employed comprises 600 Japanese, 3,200 Chinese and about 200 Koreans. In summer time, last year, the total number of coolies employed exceeded 20,000. The ordinary coolies wage ranges from 45 sen silver to 50 sen silver per day.

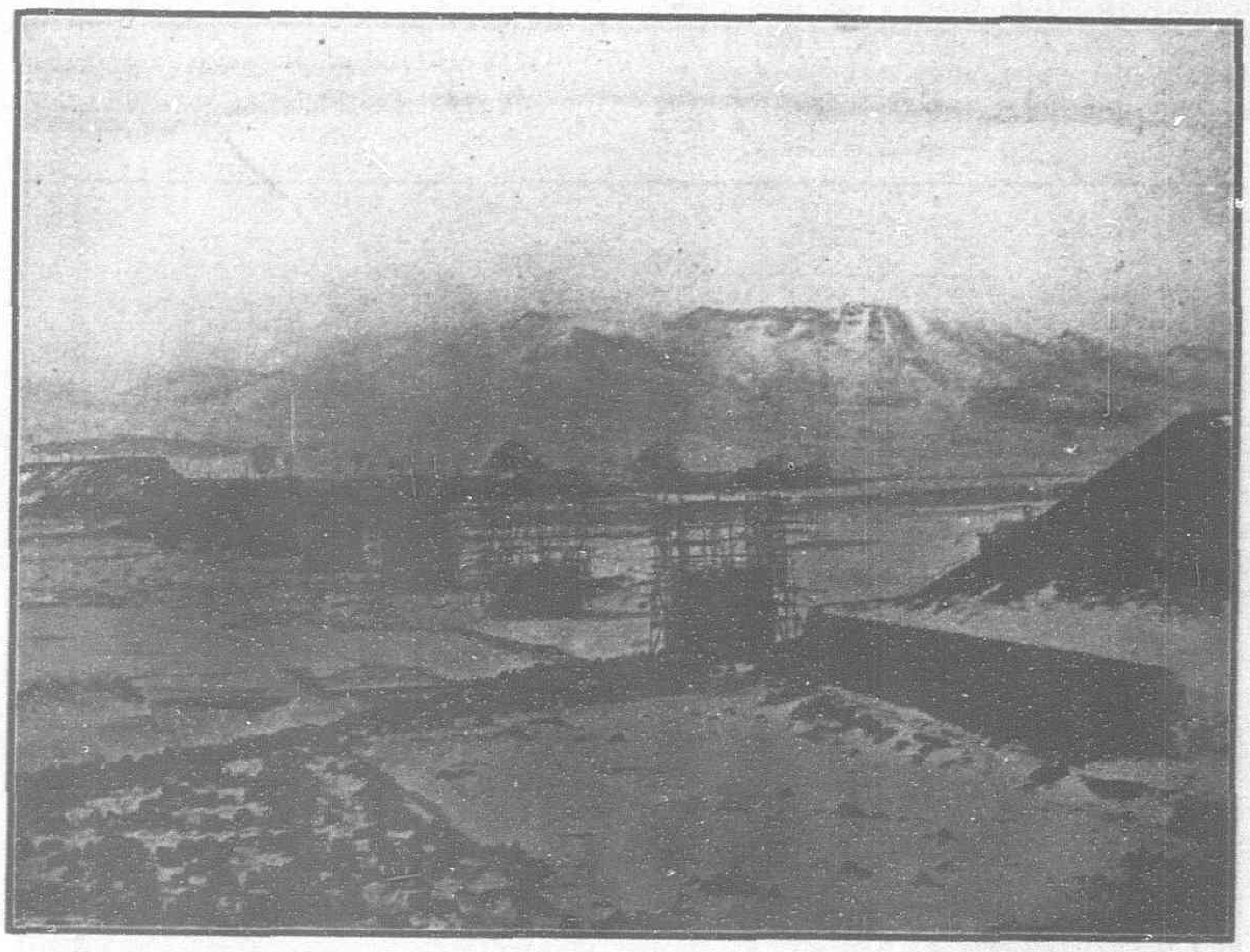
(10) Supervision of Work.—The line is divided into four divisions which are subdivided into 19 sections. The division superintendent's quarters are located at Penchihu, Chiaotao, Chikuanshan and Shahochen (Antung)

The personnel of the superintendents' quarters comprises 4 superintendents, 9 clerks, 37 foremen.

(11) Geological Formation—From the Yalu River proceeding up north west to Chikuanshan the geological formation consists of granite on the right side of the Railway Line, and of gneiss on the left; about Chikuanshan it changes to stratified rock of cambria as far west as Penshihu where a carboniferous layer is found surrounded by old vision limestone. From Penshihu, going to westward the strata changes to cambria again, the alluvia extending to Mukden, the terminus of this line.



PIERS FOR BRIDGE NO. 8.—OVER THE HSIHO (FEB. 1911.)

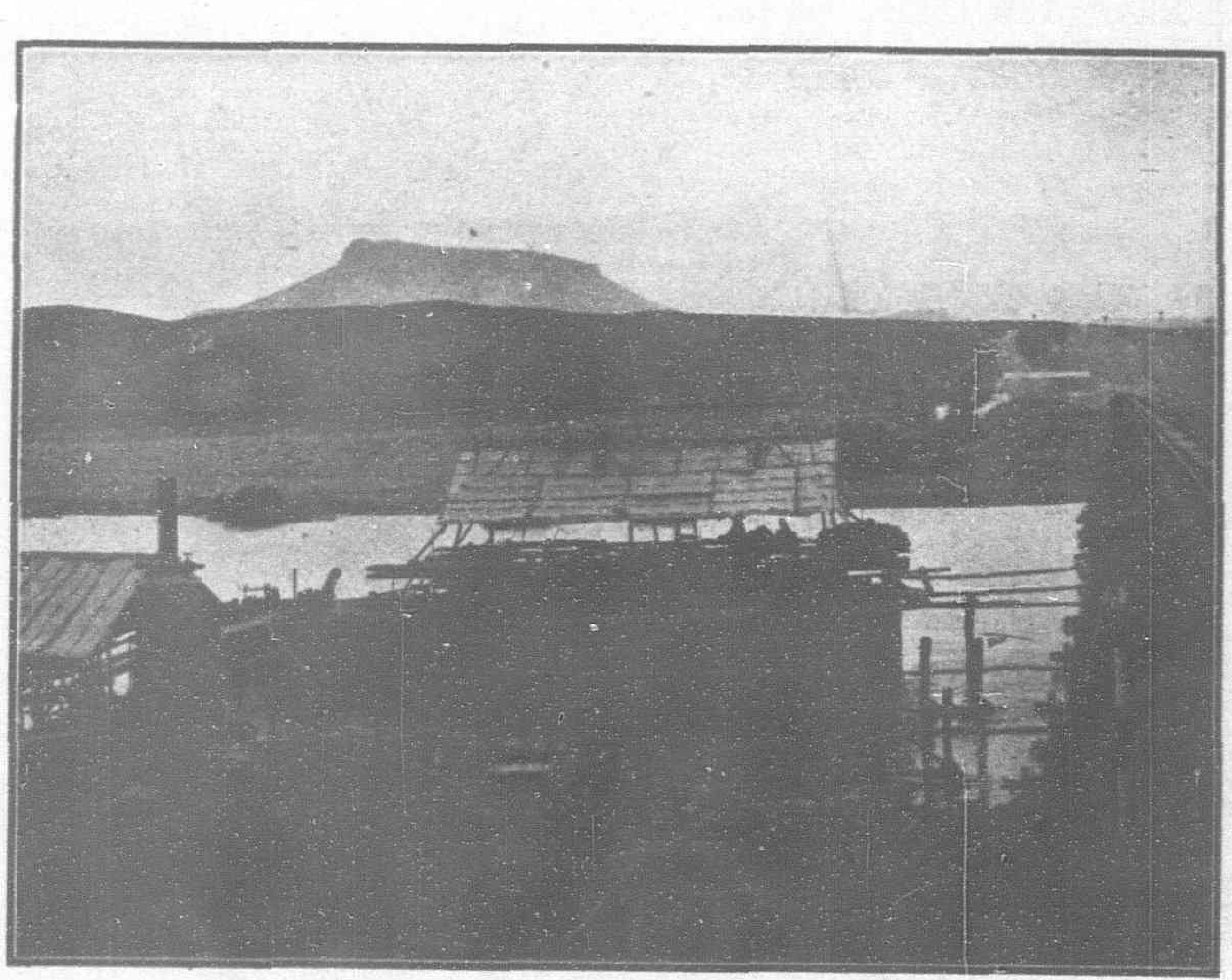


HSIHO BRIDGE (No. 12) IN COURSE OF CONSTRUCTION, FEB. 1911.

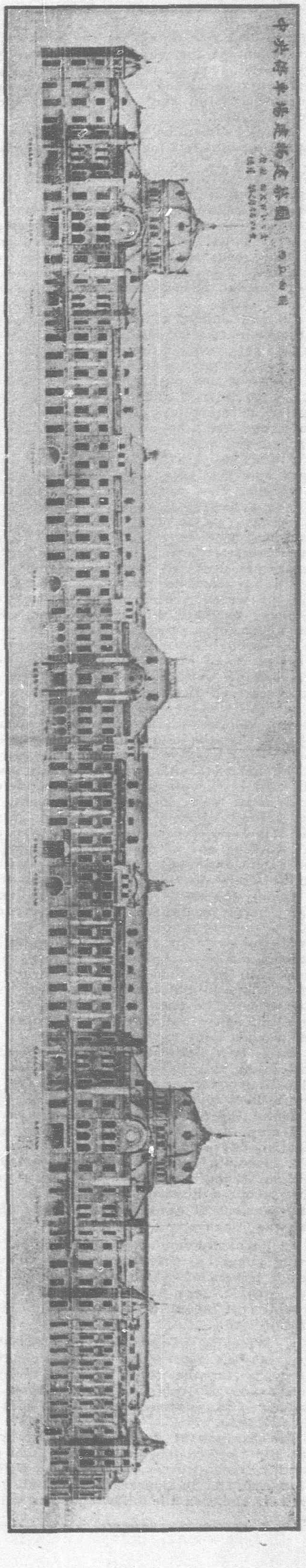
ment is authorized at the charge of this special account, to issue public loans or make temporary loans from other special accounts and other sources, and for the purpose of consolidating or redeeming public or temporary loans chargeable to this account, the Government is further authorized, at the charge of the same account, to issue public loans or make temporary loans from other special accounts and other sources. The public and temporary loans above referred to, the public loans already issued to defray expenditures required for carrying on the railway enterprise, the public loans already issued or to be hereafter issued for the consolidation or redemption of the loans last-mentioned, the public loans issued under the provisions of the Railway Nationalization Law, and the debts chargeable under the same law to the Government which have not yet been completely repaid, all these loans are chargeable to the special account under consideration; and the amount required in each financial year for their redemption or payment of interest thereon is to be transferred to the Special Account for the National Debt Consolidation Fund. The Railway Special Account is subdivided into the Capital Account, the Revenue Account, and the Reserve Account. The Capital Account has for its revenue the moneys transferred from the railway profit, proceeds of public and temporary loans, proceeds of sale of its property, receipts from materials and structures for railway use, and miscellaneous receipts belonging to it, and for its expenditure the cost of the construction and repair of railways, redemption of its debts, cost of materials and structures for railway use, and other miscellaneous expenses chargeable to it. The Revenue Account has for its revenue the various receipts from the working of the railways, charges for the loan of articles forming part of its capital, interest on loans advanced, and miscellaneous receipts belonging to it, and for its expenditure various expenses required for the working of the railways, expenses for the upkeep, repair, and replacing of articles forming part of the capital, interests on debts, and miscellaneous expenses chargeable to it. The excess of the total annual revenue over the total annual expenditure in the Revenue Account becomes the profit, and the balance remaining after deducting therefrom the amount to be transferred to the Reserve Account is to be transferred to the Capital Account. The Reserve Account has for its revenue the sum not exceeding ten per cent. of the railway profit to be annually transferred therefrom, and for its expenditure sums required to meet deficit in the revenues of other accounts caused by natural calamities, accidents, and other unforeseen occurrences.

This law severs the railway finance completely from the general account, and from now on the railways must meet all obligations from their own profits, and all new lines and extensions must be constructed from the surplus, without any appropriation from the general fund.

The capital invested in the Government Railways up to the end of March 1907 was Yen 189,966,470. Adding to it yen 195,224,066 expended during the year, and subtracting yen 4,843,079 for depreciation, gives a bal-



PIER CONSTRUCTION OF BRIDGE AN THE TAI TSU HO.



FRONT ELEVATION OF THE NEW GRAND CENTRAL RAILWAY STATION AT TOKYO ance of yen 380,347,457 as the total capital investment at the end of the fiscal year March 31st, 1908. Of this amount Y283,355,218 represents unredeemed capital, yen 71,273,916 redeemed capital and yen 25,718,323 special working fund.

With the absorption of the private lines the capital account was increased to Y753,886,988 at the end of the 1909 fiscal year. For this expenditure the Government owns 4,542 miles of road open to traffic, with a total track mileage of 5,020 miles. This operating mileage has since been increased to 4773 miles, with several hundred miles of new roads and extensions under construction. The cost of construction of the state lines at the end of 1909 was Y503,450,000 (£51,567,141).

The total number of passengers on Japanese railways in 1908-09 was 146 973,870, of whom 123,337 543 travelled on State railways and 23,476,327 on private lines; and the total amount of goods carried during the same period was 25,455,799 tons, of which 23,524,559 tons were carried on State lines and 1 931,240 on private lines; and the total receipts from the traffic reached yen 83,688 575 (£8,572,014) of which yen 79,821,583 (£8,175 928) was earned by State lines and yen 3,866,992 (£396,086) by private lines. The working expenses amounted to yen 44,867,153 (£4,595,632), of which yen 42 859,637 (£4 390,007) was spent by State lines and yen 2,007,516 (£205,625) by private lines; and when the above working expenses are deducted from the receipts, the net profit comes to yen 38,821,422 (£3 976,382) of which yen 36 961,946 (£3,785,921) belonged to State railways and yen 1,859,476 (£190,462) to private railways.

The estimated receipts and expenses of the Railway Board for the Financial Year 1910-11 are, receipts yen 90,481,321 (£9,267,778) and expenses, yen 81,507,594 (£8,348,622), giving a net profit of yen 8,973,727 (£919,157); in these expenses is included yen 32,090,641 (£3,286,965), the interest on the public loans for the purchased railways, etc.

The financial outlook for the State owned railways is exceptionally bright, and with economical and efficient management, and the natural increase of traffic and profits, there is every reason to hope for a successful working out of the elaborate program for extensions and improvements, without undue strain on the special railway finances.

Among the most important of the extensive reforms in the present railway program, is the conversion of the present 3ft. 6in. gauge to 4ft. 8½in., and as soon as the necessary financial arrangements are made, work will be commenced on the trunk line from Tokio to Shimonoseki, a distance of 704 miles. The cost of converting this section is roughly estimated at Y160,000,000, $80,000,000 gold (£18,000,000).

Baron Goto, Minister of Communications, some time ago made public a detailed explanation concerning the conversion of the trunk lines and the estimate cost thereof:—

Before the Government decided upon the widening of the gauge the following investigations were made:

1. Possible increase of transportation power without changing gauge. This plan would cost about a hundred million yen in the improvement of gradients at Hakone, Sekigahara, Osakayama, etc.

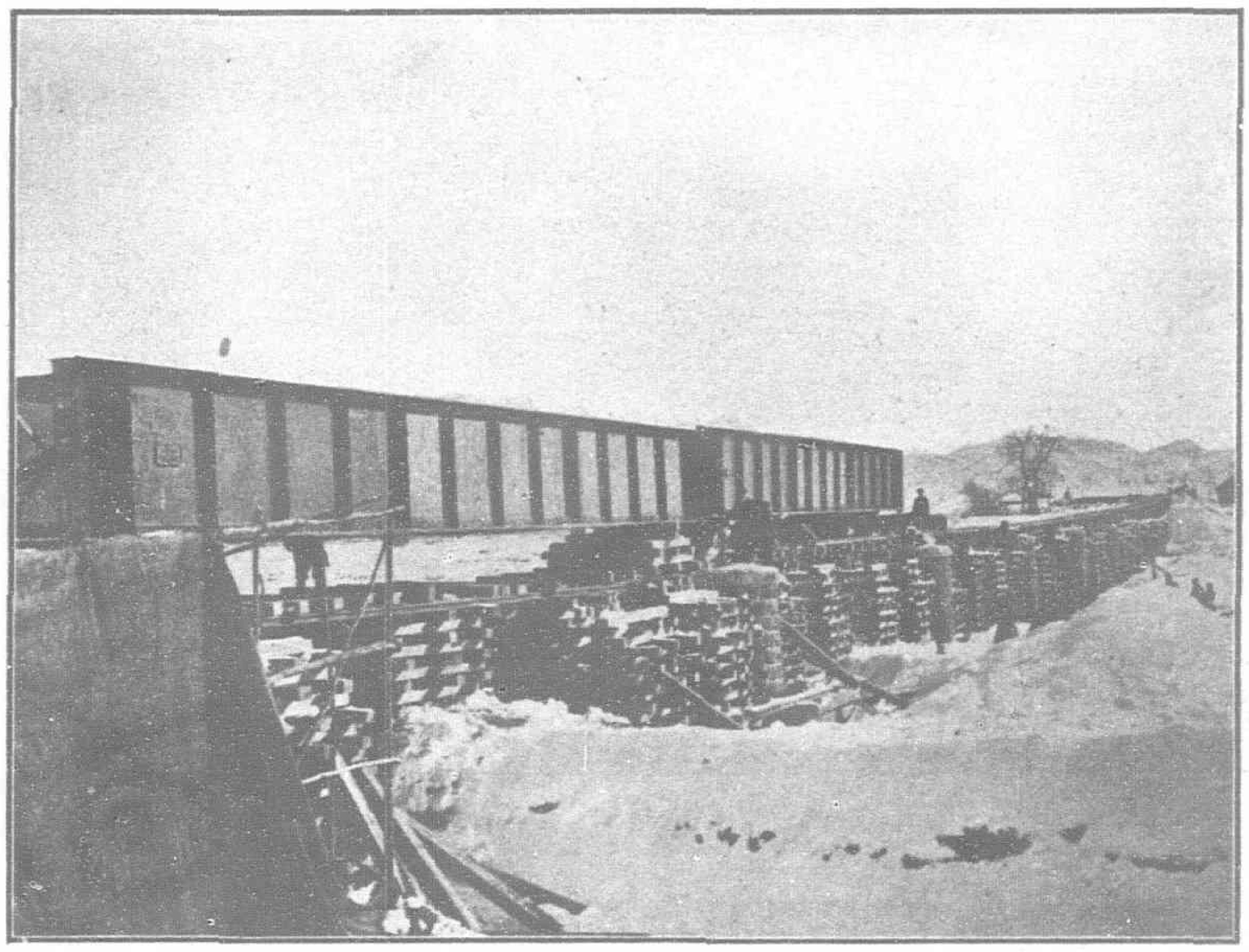
2. Reconstruction of the lines without widening gauge, so that the greatest transportation powers of which narrow gauge lines are capable, may be obtained. This plan would cost about a hundred and ninety million yen.

3. Widening gauge to 4 ft. 8½ in. at the cost of yen 230,000,000. The expenditure necessary for the third plan is greater by yen 100,000,000 compared with the first plan and by yen 30,000,000 compared with the second plan.

The Government therefore decided to carry out the third plan beginning next fiscal year, namely, reconstruction of the lines between Shimbashi and Shimonoseki on the wide gauge system, and then the following lines will be widened.

Yokohama Custom House Branch Line, Yokosuka, Hiratsuka, Taketoya, Atsuta, Otsu, Narita, Onohama, Wadatage, Uno, Kure, Ujina.

Railway Finance.—Since the establishment of the Railway Board the authorities have been engaging in the readjustment of the special Railway Accounts. Great attention has been paid to the economy of expenditure for coal, petroleum, the curtailment of employes, etc., and in this way a saving has been effected of yen 3,000,000 in regard to coal and petroleum, yen 1,600,000 in regard to employes and officials.



TSAOHOKOU BRIDGE NO. 3 IN COURSE OF CONSTRUCTION.

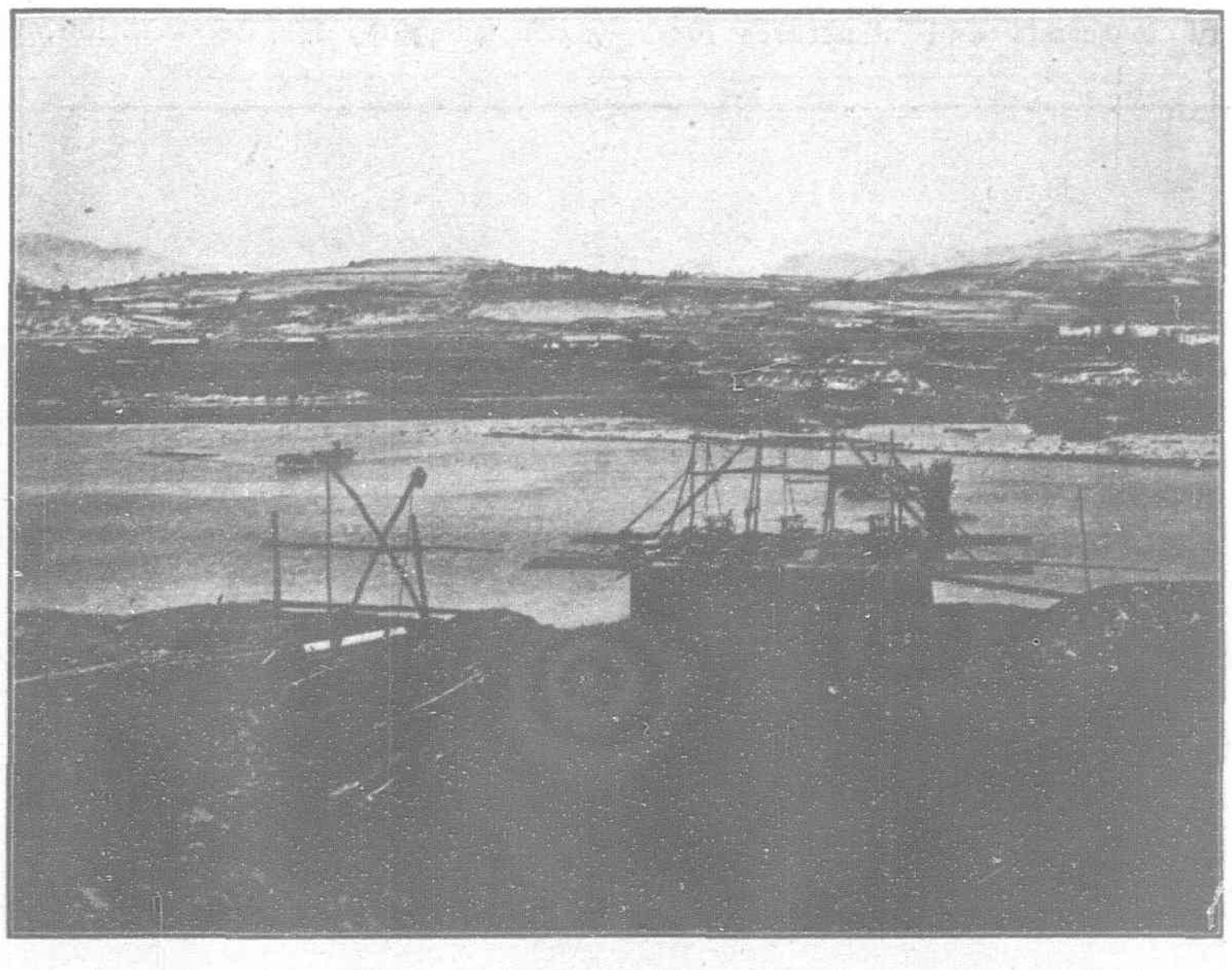
Redemption of Debt.—The total amount of the railway debt is estimated at yen 830,000,000 of which yen 657,270,000 is in the form of public bonds. Even supposing that neither profit nor loss results from the new lines after 1911, not only will the total amount of debt be redeemed by 1972, but even a net profit of yen 52,000,000 will be obtained, and after 1973, the annual net profit of yen 88,000,000 will be realized. If the new project for reconstruction of the lines is not carried out, the debt will be redeemed in 1958, and after 1959 a net profit of over yen 88,000,000 will be obtained. So that through the reconstruction of the trunk lines the period for the redemption of debt will only be extended by 14 years.

Light Railways.—The Government will introduce into the Diet the Bill providing annual subsidies to the amount of at least yen 10,000,000 for the construction of light railways. And at the same time Government light railways will be laid in Hokkaido and in Japan Proper.

Annual Expenditure—The appropriation for the reconstruction of the lines will be made in the following sums annually:—

1911	4,449,000
1912	4,550,000
1913	6,000,000
1914	10,000,000
1915	13,000,000
1916	14,000,000
1917	15,000,000
1918	25,000,000
1919	27,000,000
1920	27,000,000
1921	30,000,000
1922	30,000,000
1923	24,051,000

New Lines Between Tokyo and Yokohama.—The new double tracks between Tokyo and Yokohama which are now under construction will be converted into broad gauge. The original expenditure for the lines was estimated at yen 8,000,000, but in changing the plan the expenditure will be increased by yen 1,300,000. This expenditure is included in



PIER CONSTRUCTION FOR THE HSI HO BRIDGE.

yen 230,000,000 which is the total amount needed for the reconstruction of the trunk lines.

Fares will not be Reduced.—The Japanese railways occupy third position among the railways of the world in regard to lowness of fare. It is premature to expect the reduction of fare after the gauge is widened. But the public should know that the railways, after they are reconstructed will be better able by increased capacity to provide the traffic which may make it feasible for the Government to reduce the rates.

For convenience of administration the State lines are divided into five districts with headquarters as follows;—

Eastern District office, Uyeno, Tokyo; Central District office, Shombashii, Tokyo; Western District office, Kobe; Hokkaido District office, Sappora; Kyushu District office, Moji. There is one branch office at Yonago. The district management is in turn under the supervision of the Ministry of Communications, composed of a Secretariat, Railway Administration, Construction, Transportation, and Finance departments presided over by the Minister and the Vice Presidents of the Board.

Rolling Stock.—The State Railway carriages and wagons used are built almost exclusively at home. The former, excepting in case of local sections, are practically of bogie type cars, while wagons are of 4 wheel type. Nos. 4, 5, 6, 7, and 8 in the annexed drawings show types of bogie cars lately built at home, and Nos. 9 and 10 show those now in course of building. These bogie cars are used for express trains run on truck lines, as between Nagasaki and Moji, Shimonoseki and Tokyo, and Tokyo and Aomori. A train of this special service is generally composed with five to eight of such bogies. The compartment is divided to furnish largest possible seating space and height admissible in narrow gauge system. Aside from the Government Car Shops many carriages and wagons are made at the works of the Osaka Railway Car Co., Nagaya Car Works, and the Amano Works at Tokyo.

As shown in the tables, the rolling stock returns comprise 2,227 locomotives, 5,510 carriages, and 34,334 wagons. Their ratios per 10 traffic miles correspond to 4.7 locomotives, 2.5 carriages, and 71.9 wagons. The locomotives used come in greater part from foreign works, as British, American, and German. but at the same time those built at home are not small. The drawings Nos. 1, 2 and 3 show some of the home built locomotives that are most commonly used. With the greater speed of passenger trains and increased tonnage of freight trains, engines equipped with wheels of wider radius and of heavier weight have to be adopted. In view of this it is contemplated to adopt for passenger trains engines with wheels measuring 5.3 feet and 50 tons, equipped with superheater, and for freight trains Millet Type locomotives with 4.1 ft. wheel and 54 tons.

The approved list of locomotive makers for the State Railways is:—

A. Borsig, Tegel, Berlin; Baldwin Locomotive Works; Berliner Maschinenbau A. G.; Beyer, Peacock & Co.; American Locomotive Co.; Hannoverische Maschinenbau A. G.; Henschel & Sohn, Cassel; Krauss & Co., Munich; A. Maffei, Munich; Robert Stephenson & Co.; La Société John Cockerill; North British Locomotive Co.; Vulcan Foundry; Kitson & Co.; Loco werke der K. K. priv; Oesten and Staats-Eesen bahm G. Vienna.

For repair of locomotives and cars, 23 work shops are maintained throughout the country, employing over 16,000 hands. Of these at Shimbashi, Omiya, Kobe, and Takatori are of larger scopes than others. All these works are operated in most cases by steam appliance. It is intended, in view of the facilities which Japan supplies in regard to water power plant to change to the use of electric power. The matter is now under investigation. As to the method of work imposed on the hands, it is, with rare exception for special work, carried on as piece-work, so as to expedite the progress of the work and to minimize the time of repair. The photos show parts of the scenes at the Omiya Works. This establishment is situated several miles north of Tokyo, possesses yard lines aggregating 8.3 miles, and the building shops capable to receive 36 locomotives at one time.

JAPAN'S RAILWAYS

	Hokkaido.	Eastern.	Central.	Western.	Kiushu.	Yonago Branch Office.	For Construction.	Under Repair.	Loaned to Other Railways.	Total.
Traffic Mileage	693.4	1337.1	1023.4	1041.6	566.8	110.9	—	—	—	4773 2
No. of Locomotives	181	534	533	434	264	22	25	228	6	2227
No of Carriages	265	1105	1283	1471	511	139	—	736	—	5510
No. of Wagons	3343	7645	6393	5730	7133	167	639	3092	192	34334
No of Engine Sheds	16	29	24	28	15	2	—	—	—	114
No. of Engine Drivers	271	797	757	699	432	23	—	—	—	2979
No. of Assistant E. D.	10	41	93	59	7	2	—	—	—	212
No. of Fire Men	229	839	649	656	401	23	—	—	—	2797
No. of Assistant F. M.	32	125	226	33	23	5	—	—	—	444
No. of Workshops	4	4	4	8	3	—	—	—	—	23
No. of Workmen	1327	3867	2895	3823	2191	—	—	—	—	14103
No. of Locomotives, repaired per month	13	73	25	38	14	—	—	—	—	163
No. of Carriages, repaired per month.	33	181	222	242	44	—	—	—	—	722
No. of Wagons, repaired per month.	1112	1217	392	2076	548	—	—	—		5345

N. B. The above tabled numbers are at the end of September 1910.

SWITCHBOARDS FOR JAPAN

BY EMIL BERN

Two switchboards of considerable size have lately been built by the General Electric Company of Schenectady, New York, for the Kyoto Municipal Water Works, Japan.

The generating station board is shown in Fig. 1. It is forty feet long and consists of twenty-four three-section marble panels, supported on a pipe framework. This framework also carries the oil switches, disconnecting switches, instrument transformers and several sets of busses.

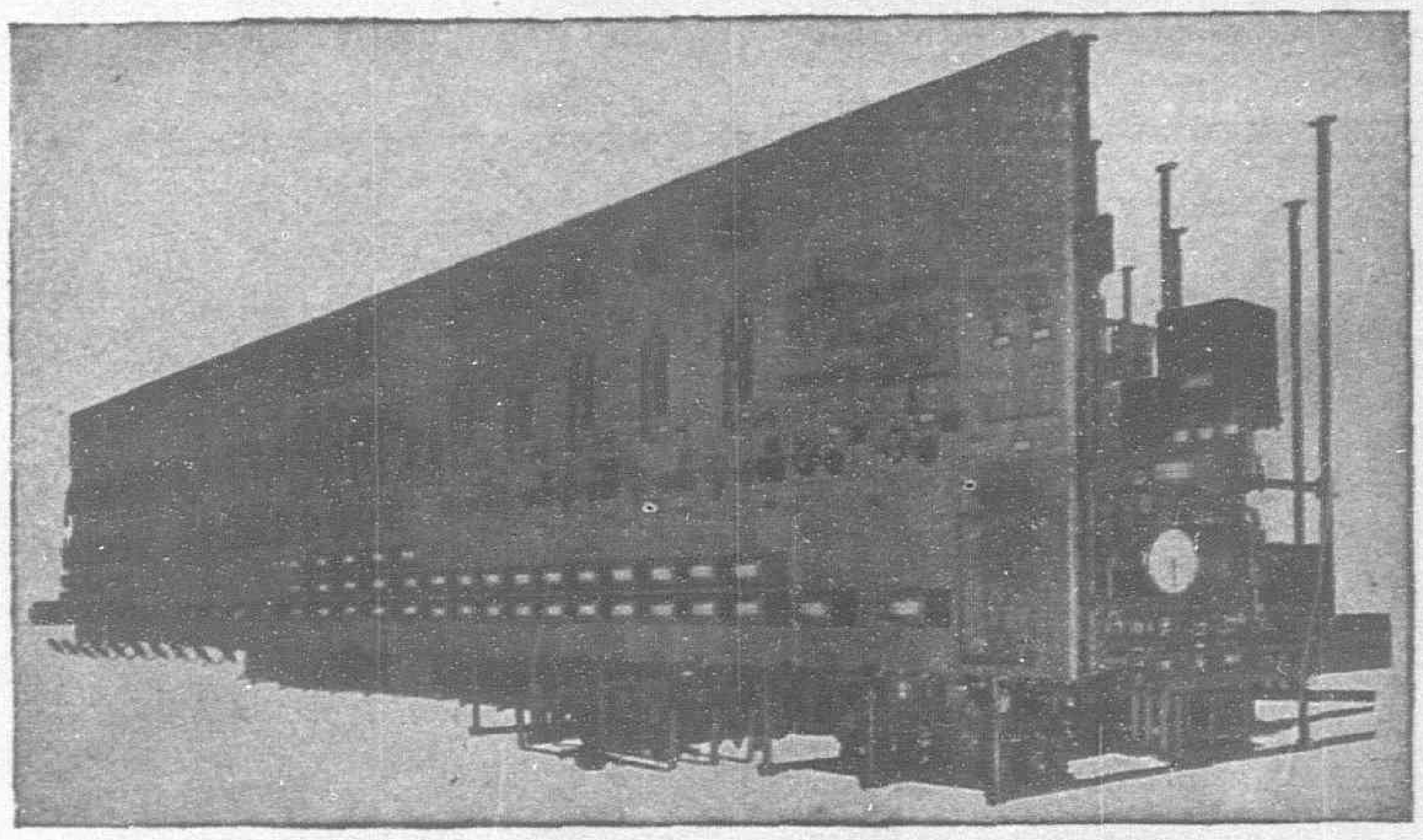


FIG. 1.—6600 AND 35000 VOLT. SWITCHBOARDS FOR MUNICIPAL WATER WORKS KYOTO, JAPAN

The station equipment controlled from this board consists of:—

2 Turbo exciters, 125 volts, 125 kilowatt.

5-3phase turbo generators, 6600 volt, 1500 kilowatt, 60 cycles.

3-3phase outgoing lines, 6600 volts, to] substation.

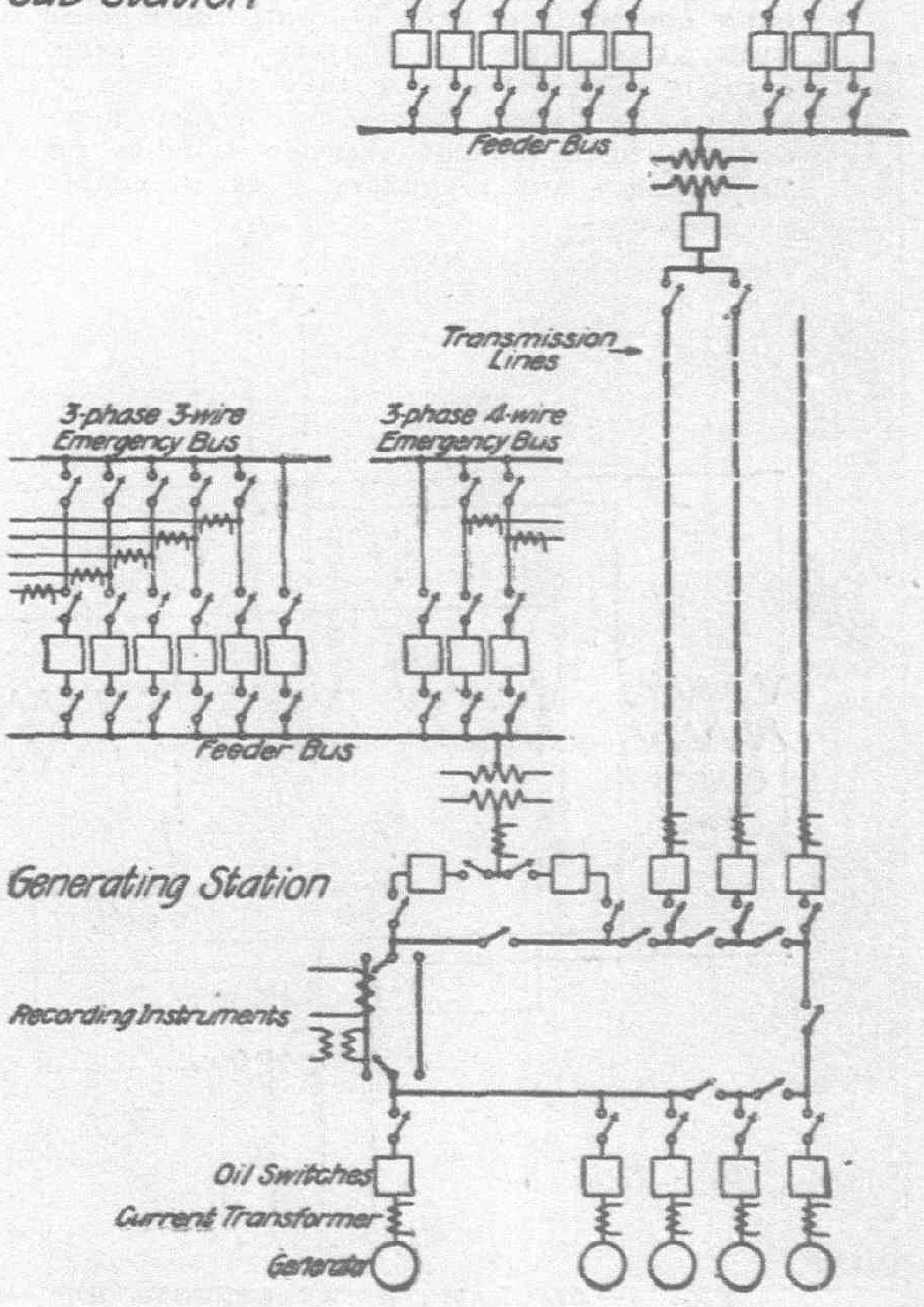


FIG. 4.—DIAGRAMATIC REPRESENTATION OF GENERATION STATION AND SUBSTATION WIRING

1 Bank of transformers 6600/3500 volt.
7-3 phase feeders, 3500 volt.
3-3 phase 4 wire feeders, 3500 volt.

Each exciter has a triple-pole, double-throw switch and a double set of busses so arranged that either exciter can be used to excite the generator fields, while the other is used for station lighting and auxiliary power.

The alternating current generator panels, in addition to the usual instrument and synchronizing equipment, have reverse current relays for automatically tripping the oil switches on a reversal of current which might result from a short circuit in the winding of the generator or from a failure of the prime mover.

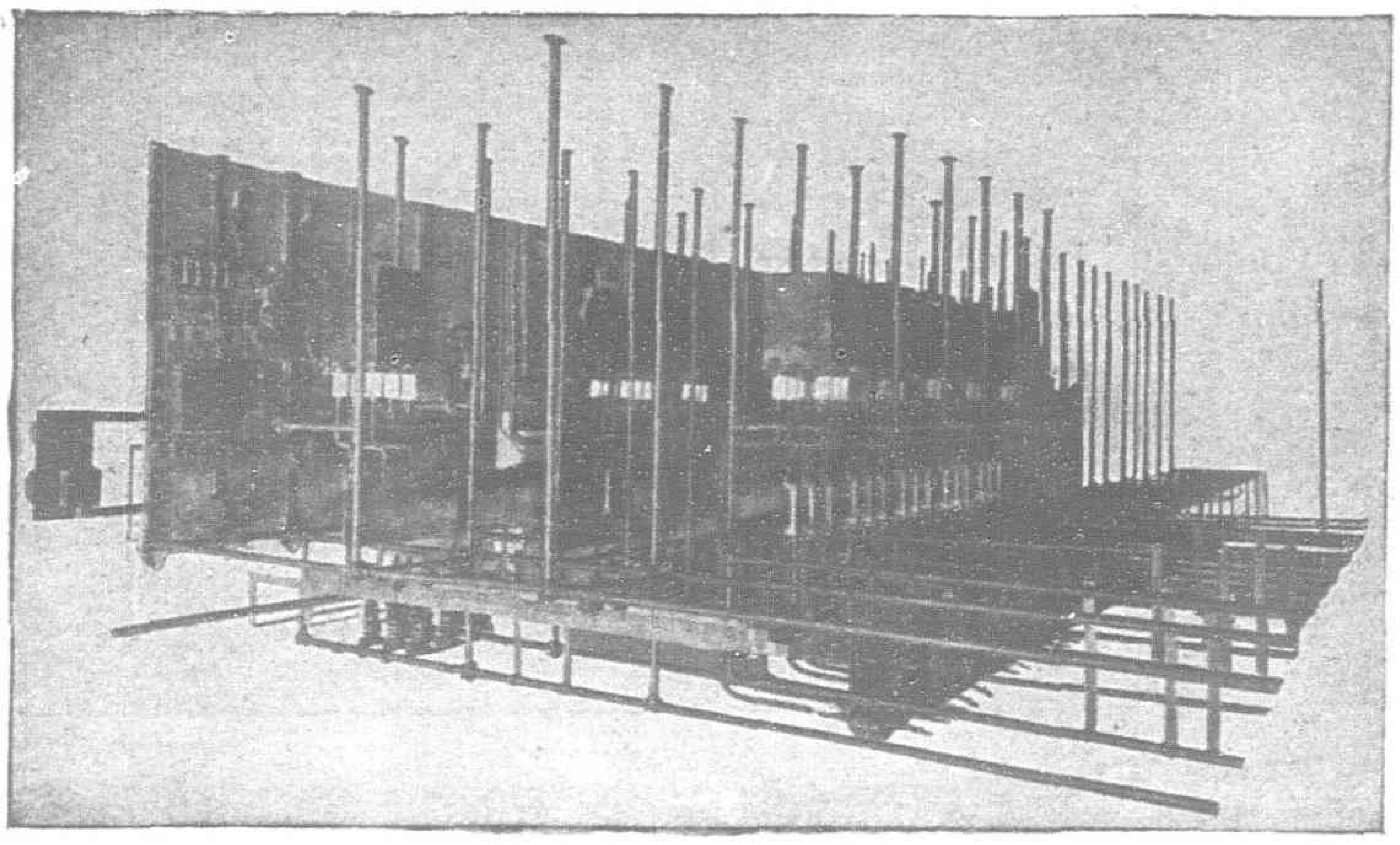


FIG. 2—ARRANGEMENT OF SWITCHING APPARATUS FOR MUNICIPAL WATER WORKS, KYOTO, JAPAN

The panels controlling the different lines and feeder circuits are equipped with inverse time limit overload relays in connection with automatic oil switches in addition to the indicating instruments.

Continuity of service was considered of primary importance in the design of this switchboard, and to insure this, an arrangement of spare equipment, as illustrated in Fig. 3, was adopted. For the transformer bank consisting of 3-750 kilowatt single phase units, one spare transformer of the same capacity was installed to take the place of any disabled unit. These four transformers are connected through transfer switches on the primary and secondary sides to enable the operator to disconnect any unit and connect the spare for service in the shortest possible time.

Spare oil switches for both the three-phase, three-wire and the three-phase, four-wire feeder systems connects the main feeder bus with a set of emergency busses to which any feeder circuit can be connected through transfer switches. The feeder oil switches are provided with disconnecting switches on each side and can be taken out of service for inspection and cleaning without interrupting the circuit. Fig. 4 shows this arrangement. This illustration also shows clearly the ring bus system used, by which certain groups of feeders may be connected to different generators independent by of other groups or the whole system operated together.

The sub-station switchboard consists of twelve marble panels and is very similar to the board for the generating station. Spare transformer systems and oil switch arrangements for the two stations are identical.

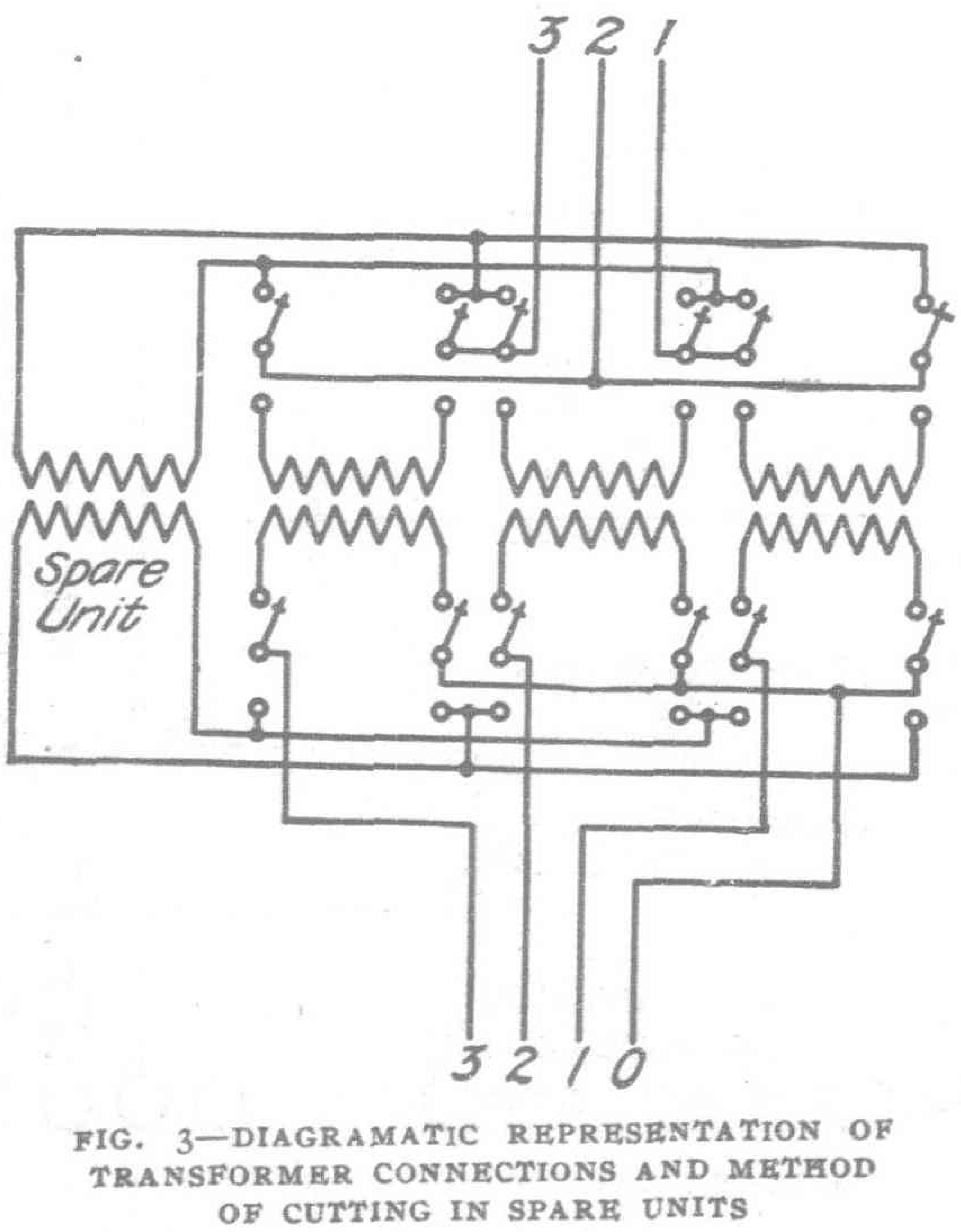


FIG. 3—DIAGRAMATIC REPRESENTATION OF TRANSFORMER CONNECTIONS AND METHOD OF CUTTING IN SPARE UNITS

FRICTION TESTS INTERPRETATION

G. A. PERLEY, M. A.

The age of contentment with any sort of a grease lubricant is past. The old expression "grease is grease" is no longer uttered by the sane engineer. In spite of this tendency towards progress we have many failures. The majority of the people interested in lubrication have chosen the grease which seems to oil the bearing and keep the temperature low, but beyond this they have no method of measuring the efficiency of the friction eradication.

The results of tests made by our testing machines are giving much insight into the true value of the grease as a lubricant as well as to its limitations. There are, however, some unfortunate facts concerning the interpretation of results. The present engineer has been taught that each bearing should be thoroughly studied as to the correct lubrication required since one bearing behaves differently than another. With such an idea he immediately condemns the friction testing machine data on the ground that perhaps the lubrication is of a different nature. This is exactly the wrong inference. A study of the friction testing machine curves and data will tell at what temperature the grease loses its power as a lubricant, as well as showing at the lower temperature how efficient the friction is reduced as compared to what we term a pure lubricant. Knowing these facts the engineer can judge the temperature of his bearing sufficiently close to choose the proper consistency of grease. Although the grease is to be applied to a different type of machine still if that grease has showed up poorly on a testing machine it stands in the realm of common sense that it will not improve much on more severe tests.

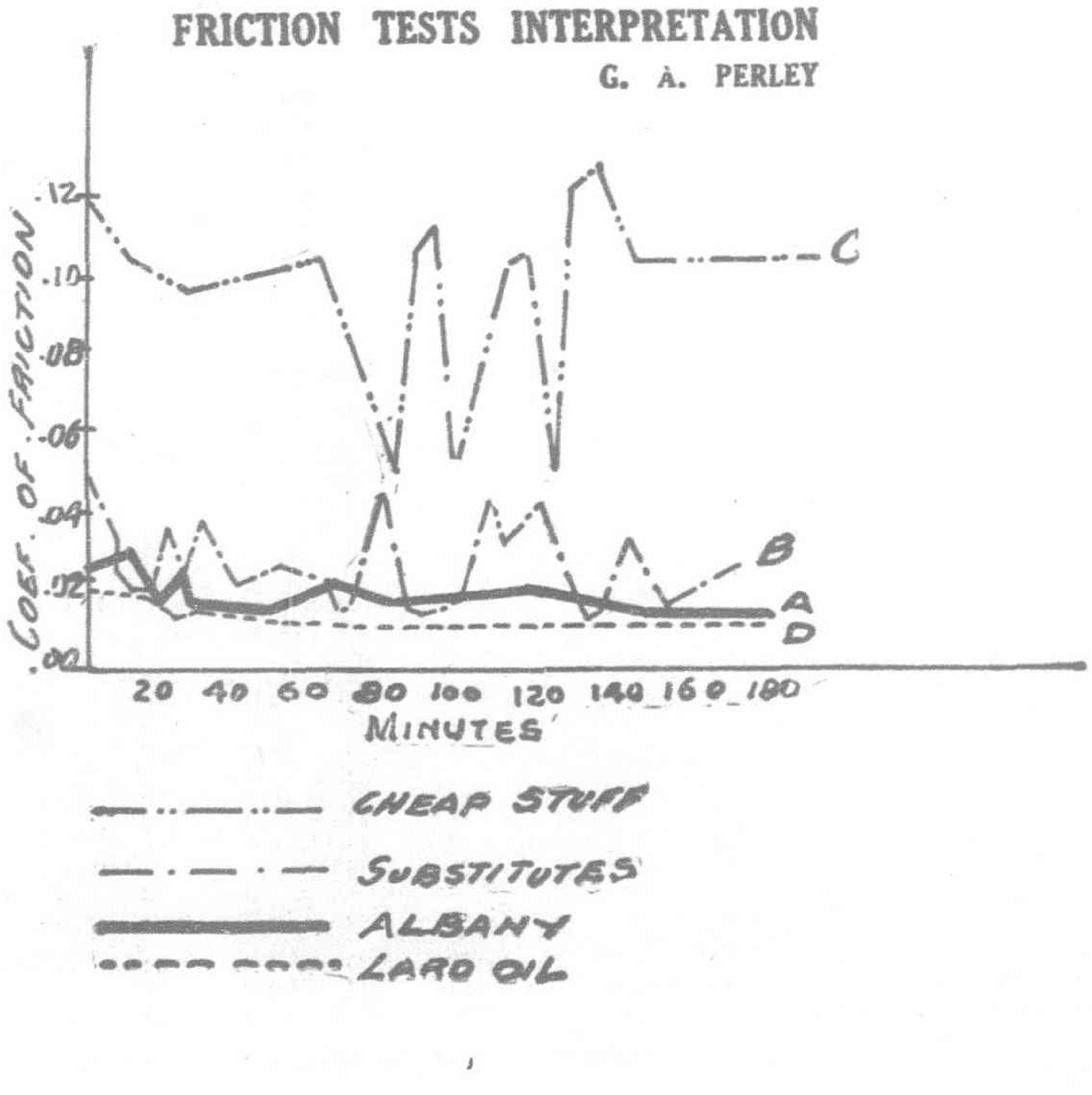
The choice of a good lubricant should involve no game of chance.

After having seen the importance of interpreting the friction curves it might be well to point out the chief features to observe. The ideal grease lubricant gives an extremely low coefficient of friction not only for a minute but for hours and days. Dependent upon the consistency, the particular grease will work best below a certain maximum temperature.

The following type curves for some characteristic greases on the maket will be given.

Curve A is a representative curve of Albany Grease; curve B, that of some greases attempting substitution for Albany; and curve C shows some materials on our market unworthy of the name grease, yet sold as such. For the sake of comparison curve D gives the results of a pure lard oil.

We see that Albany Grease gives as near perfect results as could be realized. It reduces the friction at once and *continues to maintain*



its efficiency. With the substitute grease we find at first that it reduces friction very well but sad facts appear on continued use. It gives out. Examination shows a hardened soap residue on the bearings. The oil has done its work but departing leaves behind something to undo the work it has so beautifully accomplished. The folly in using such a grease becomes apparent at once. With the cheap imitation we find that not even is the friction materially reduced to say nothing of the injurious products it leaves upon the bearing.

The moral of the above is that an engineer should make no mistake in the interpretation of friction tests. It is the grease that continues to do its work day in and day out that counts. Friction tests if carried on for a sufficient length of time will aptly show this. In other words Albany Grease is the only choice. If the engineer knows the approximate temperature and chooses the consistency of Albany adapted to that temperature, the requisites demanded by his machine will forever be fulfilled.

RECORD ORDER FOR MARINE ENGINES

What is unquestionably the largest order for gasoline engines has just been placed by the W. H. Mullins Co., Salem, Ohio, builders of Mullins Pressed Steel Boats. The order was placed with the Ferro Machine & Foundry Co., Cleveland, Ohio, and calls for 2,000 engines to be delivered within the next 90 days. It is expected by The Mullins Co. that considerably more than this number of engines will be ordered before the season is over, as the estimate was naturally made on a very conservative basis.

This order is notable in several ways. Of chief interest to the motor boat enthusiasts is the fact that this large order is indicative of a very much increased popularity in motor boats during 1911, which has been apparent to the trade for several months past. It is also evidence of the wide sale of the Ferro Engine both of which standard products are well known to our readers.

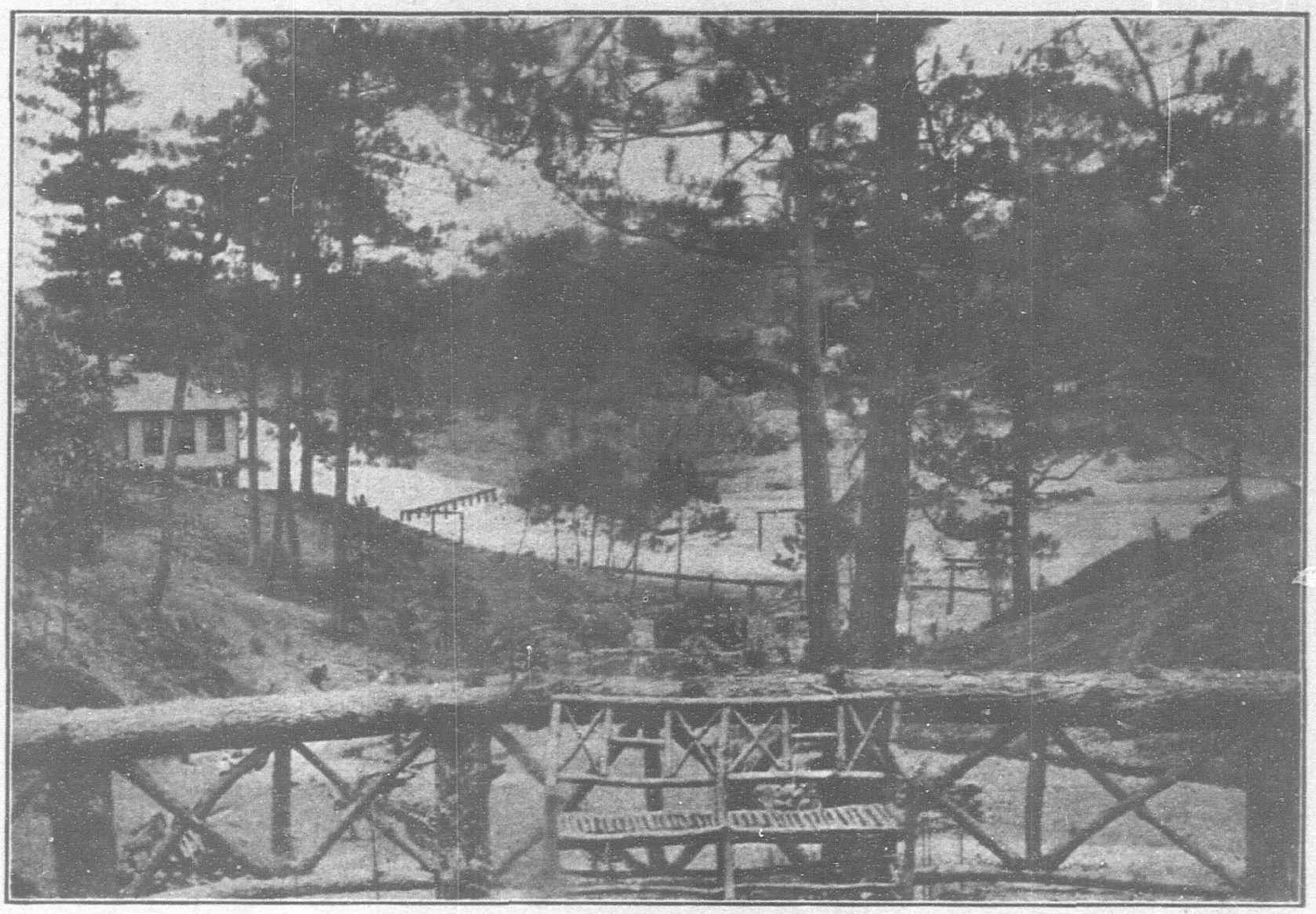
In deciding upon the engine to be installed in their boats for 1911 The Mullins Co. state that they investigated and experimented with a number of leading marine engines, endeavoring to get one that would in every way be in keeping with the high standard set by their steel hulls, and thoroughly satisfied themselves that they could do no better than to decide upon the Ferro.

FRANK L. STRONG'S ELECTRICAL DEPARTMENT

The firm of Frank L. Strong, one of the oldest machinery and electrical supply houses in the Philippines has established an electrical department in the new quarters, 105 Escolta, Manila, to meet the steady expansion of its electrical business. R. Naess, M. E. who is in charge is a graduate of Horten Technical School of the famous Norwegian college and served as designing engineer for the Watson Stillman Company and mechanical inspector of the Hudson Terminal Companies of New York for several years after which he accepted the position of electrical engineer for the Manila Electric Railroad and Light Co. He later resigned and the firm of Messrs. Johnson & Neiss was organized and he remained a member until he accepted charge of the Electrical Department of Frank L. Strong. Frank L. Strong is exclusive agent in the Philippines for the General Electric Company and has made a number of important installation of plants among which was the pumping equipment for the Manila sewer system. The department is equipped to furnish and install all kinds of electrical plant and supplies and prepared to submit designs and estimates covering every branch of electrical work.

BAGUIO, THE SIMLA OF THE PHILIPPINES

Ten years ago, if anyone had predicted that the traveler could now board a train at Manila at 10 o'clock at night and have breakfast in Baguio, there would have been some question of his sanity, for beyond Dagupan, the terminus of the Manila Railroad Company, the traveler had to depend on carabao carts to the foothills and follow a tortuous trail for days before he might reach his objective.

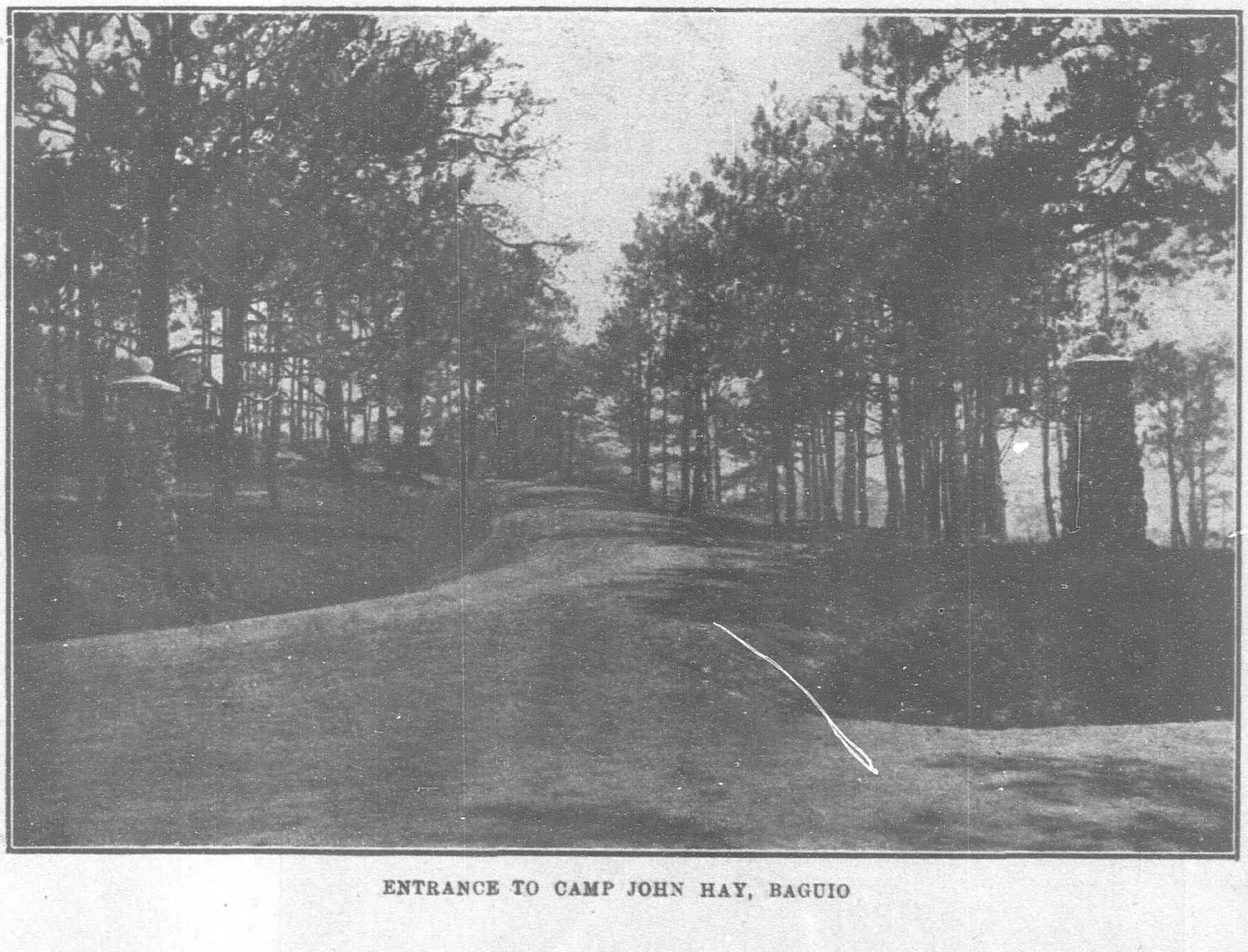


LOOKING DOWN THE VALLEY THROUGH THE JAPANESE GARDEN TO THE ATHLETIC GROUNDS AT BAGUIO

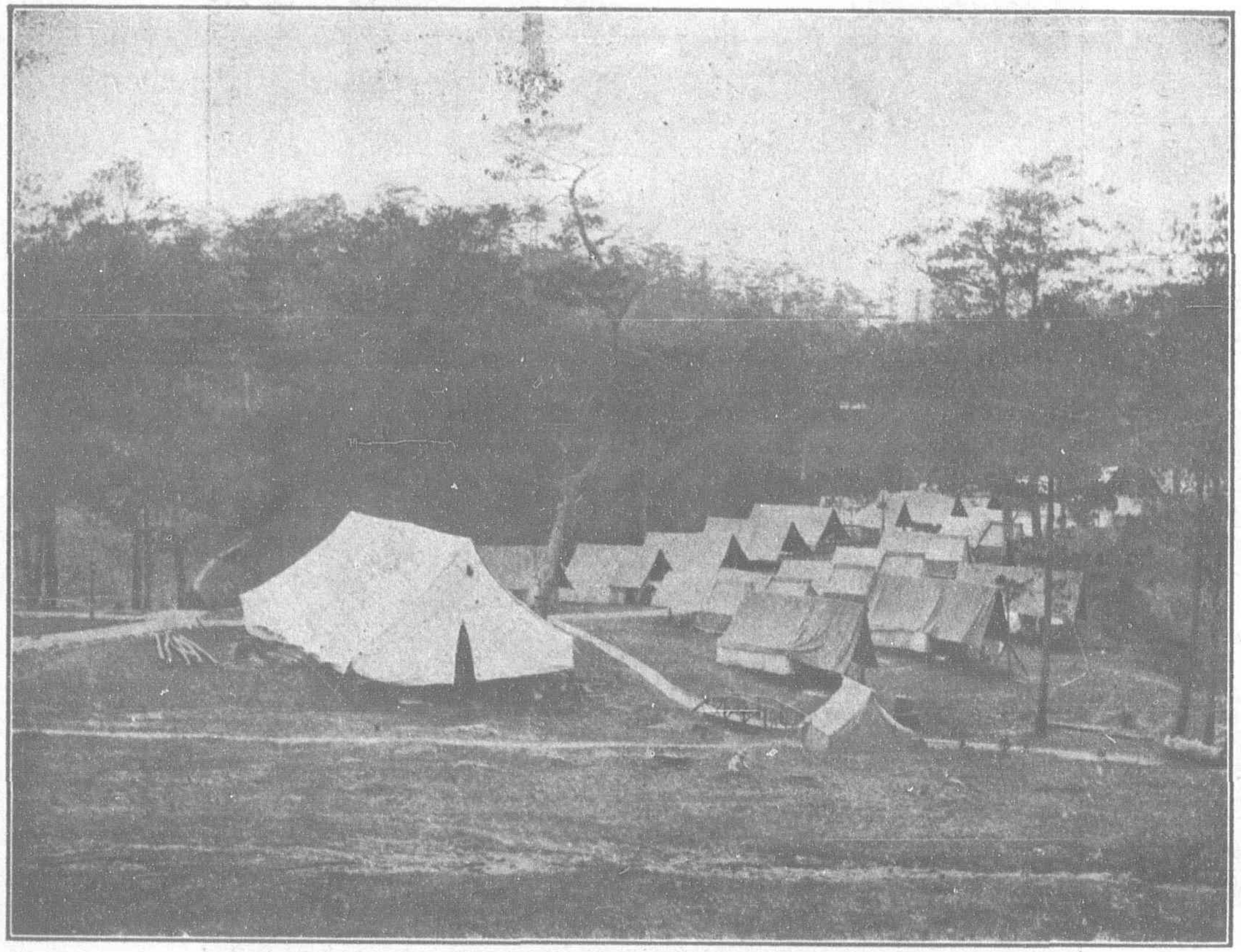
A decade ago there were but few white settlers and Baguio had little to warrant special notice beyond the fact that it was the capital of the province of Benguet, had an invigorating climate, and prospectors in that region had reported the presence of gold.

Now that is all changed. A splendid automobile road has superseded the tortuous trial; a branch of the Manila Railroad Co. now extends from Dagupan to Camp One, a point about m 21 miles from Baguio over which the traveler is whisked in less than two hours through the beautiful Alps of the Philippines to arrive at a modern town with the comforts of modern hotels provided where once lodging was represented by the local tribunal building.

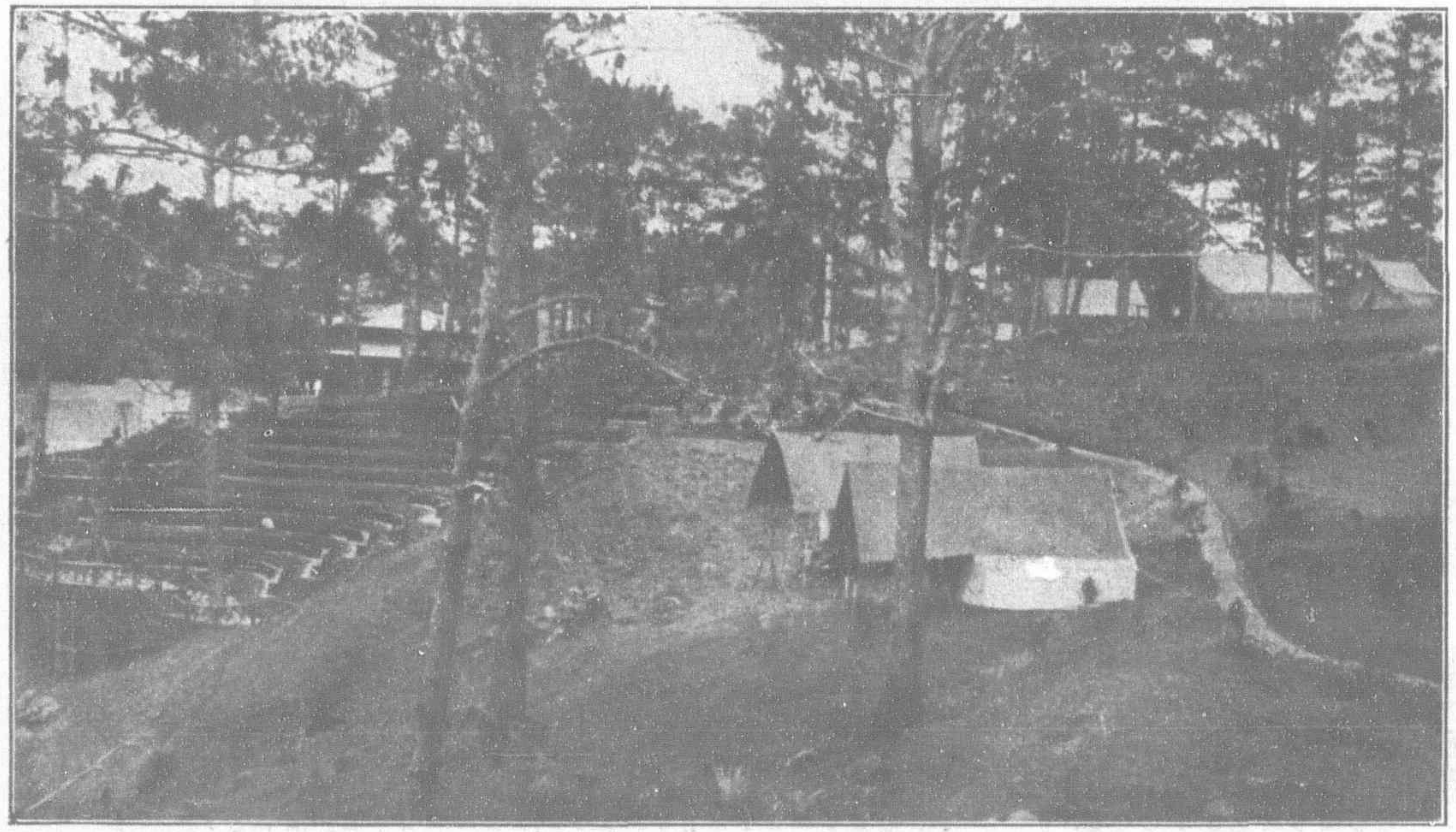
Baguio comprises a reservation of twenty



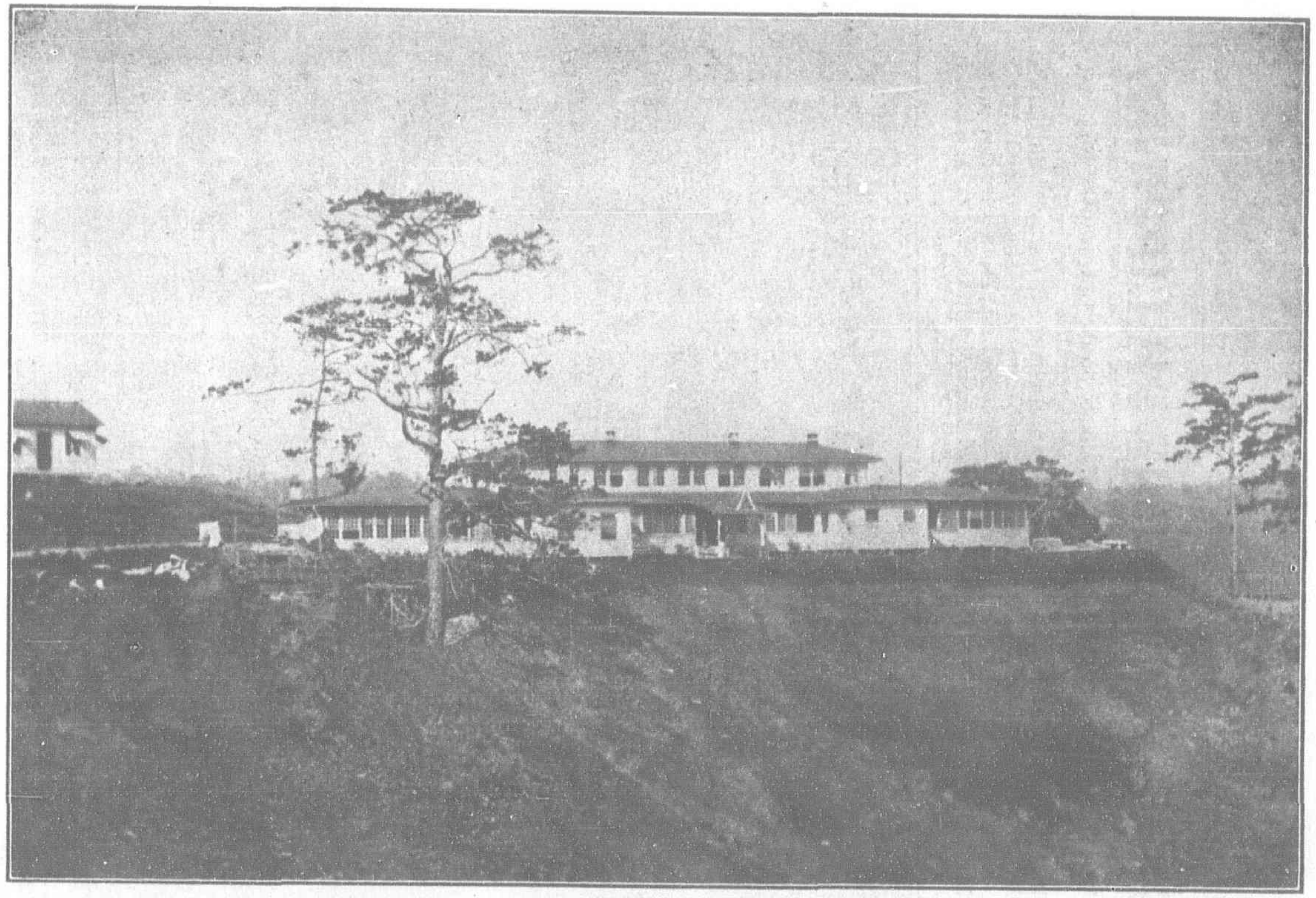
ENTRANCE TO CAMP JOHN HAY, BAGUIO



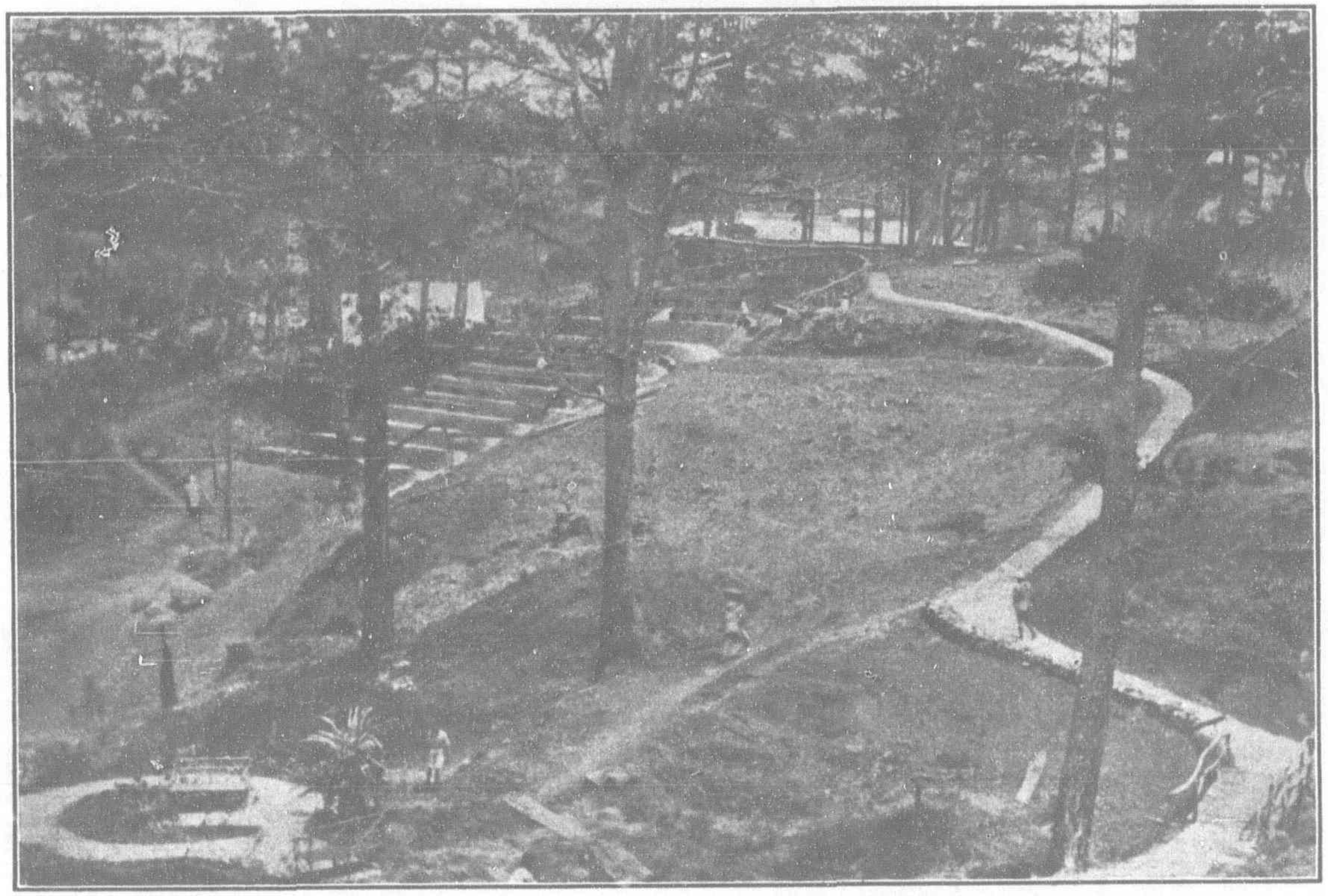
LECTURE TENT AND QUALITY ROW, TEACHERS' CAMP, BAGUIO



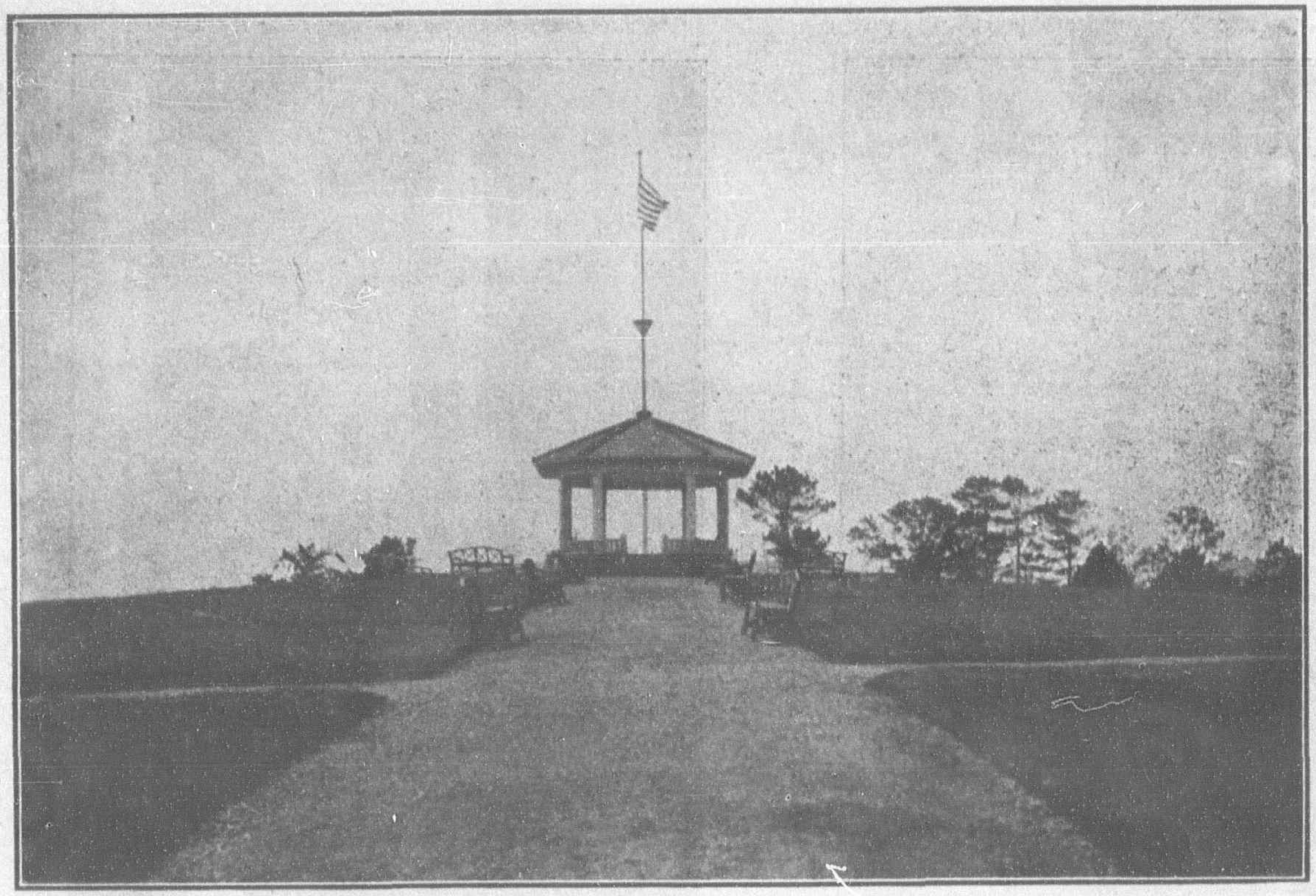
AMPHITHEATER AT TEACHERS' CAMP, BAGUIO



THE BAGUIO HOSPITAL

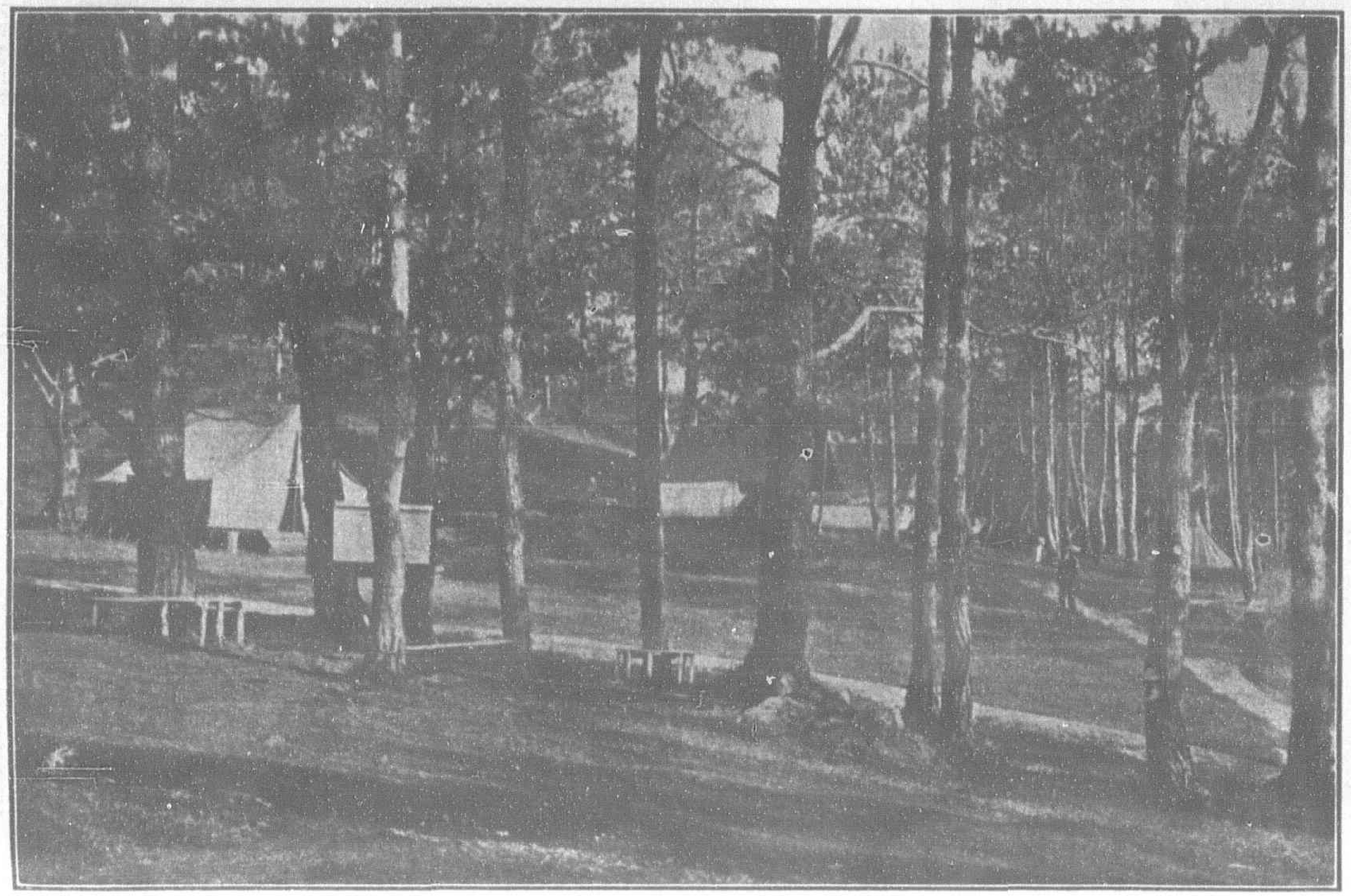


CAMP PROGRESS IN THE NEIGHBORHOOD OF THE AMPHITHEATER AT BAGUIO

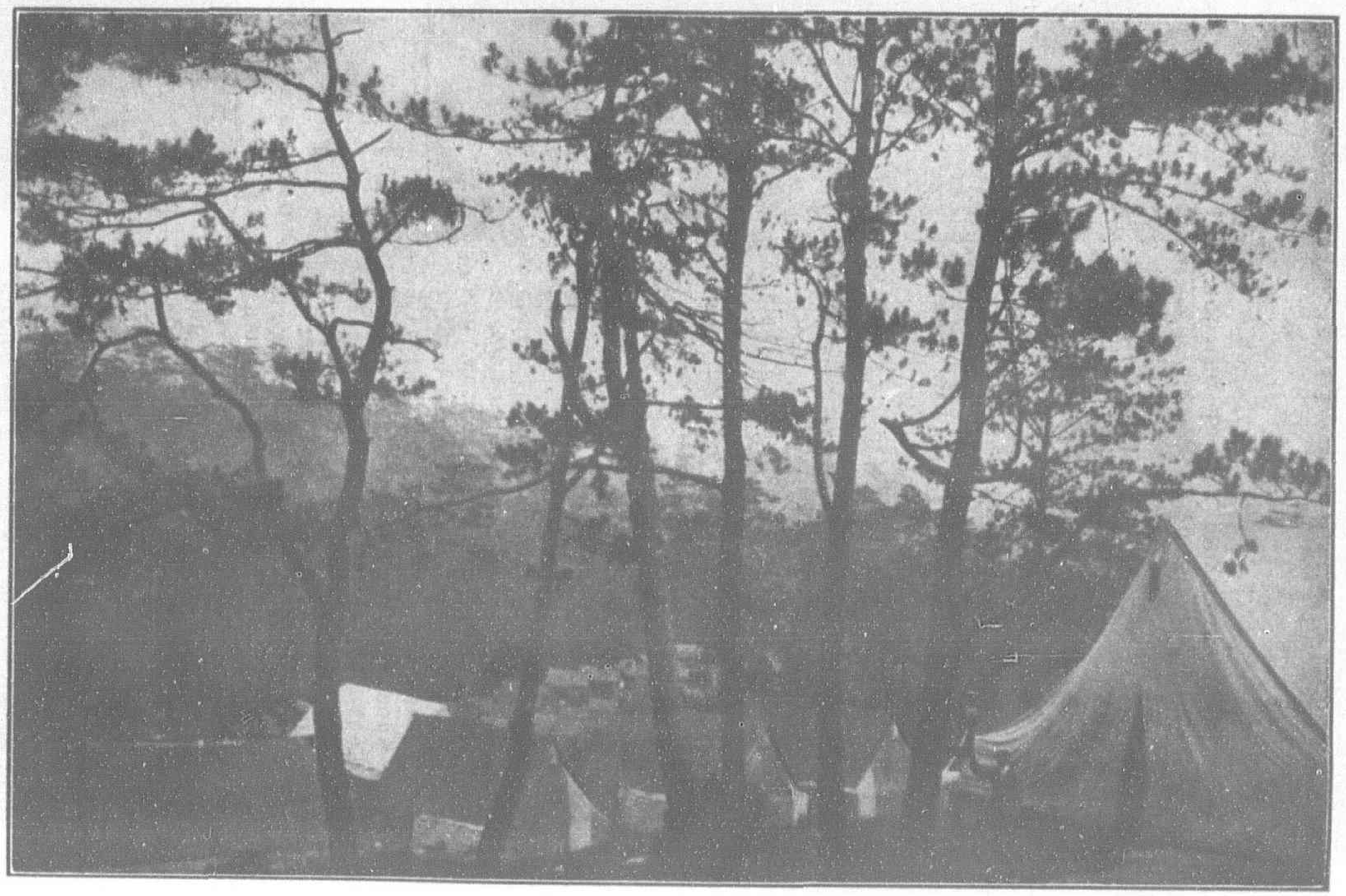


THE LUNETA AT BAGUIO.

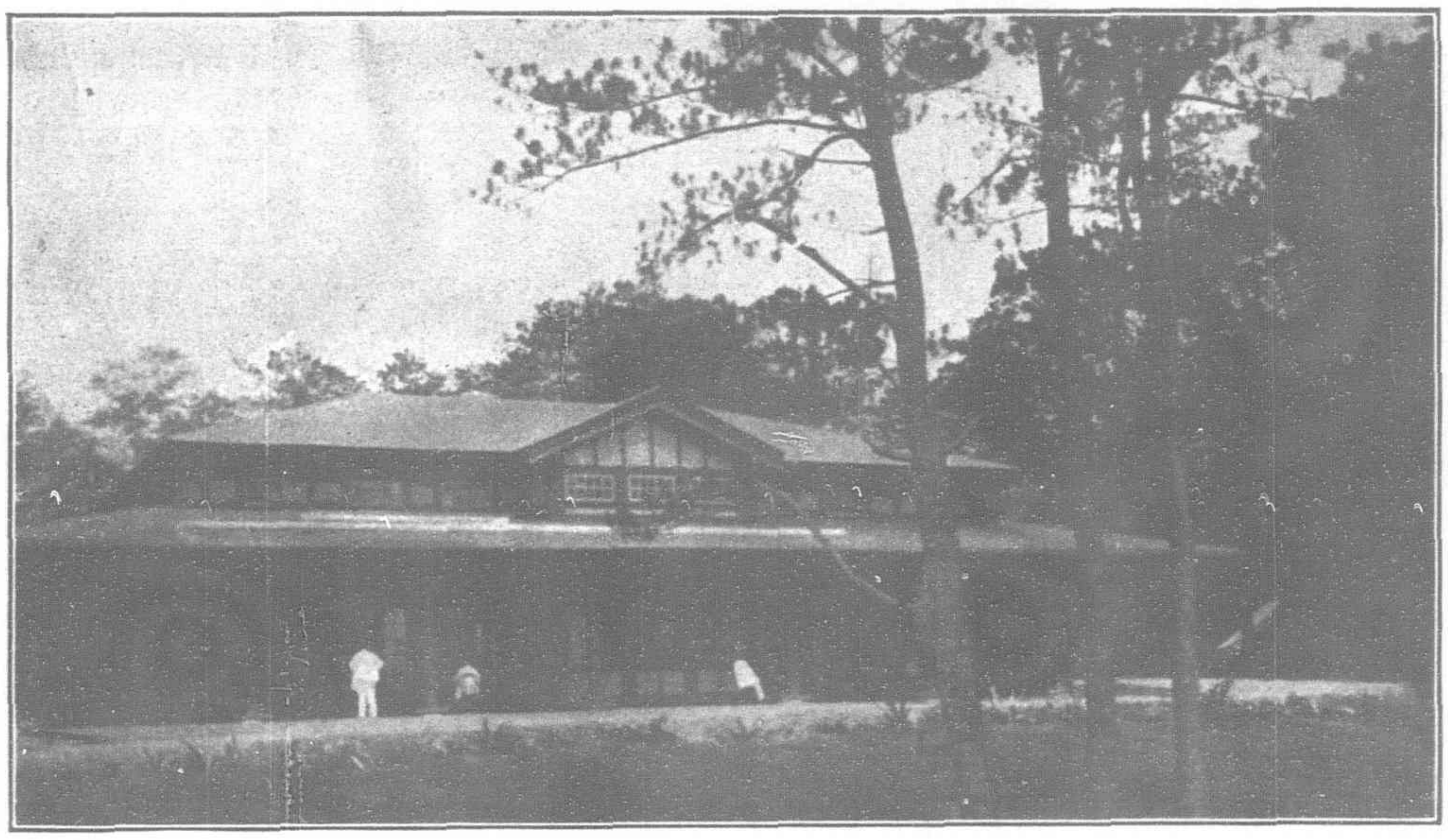
SCENE IN THE AMPHITHEATER AT TEACHERS' CAMP, BAGUIO, 1911.



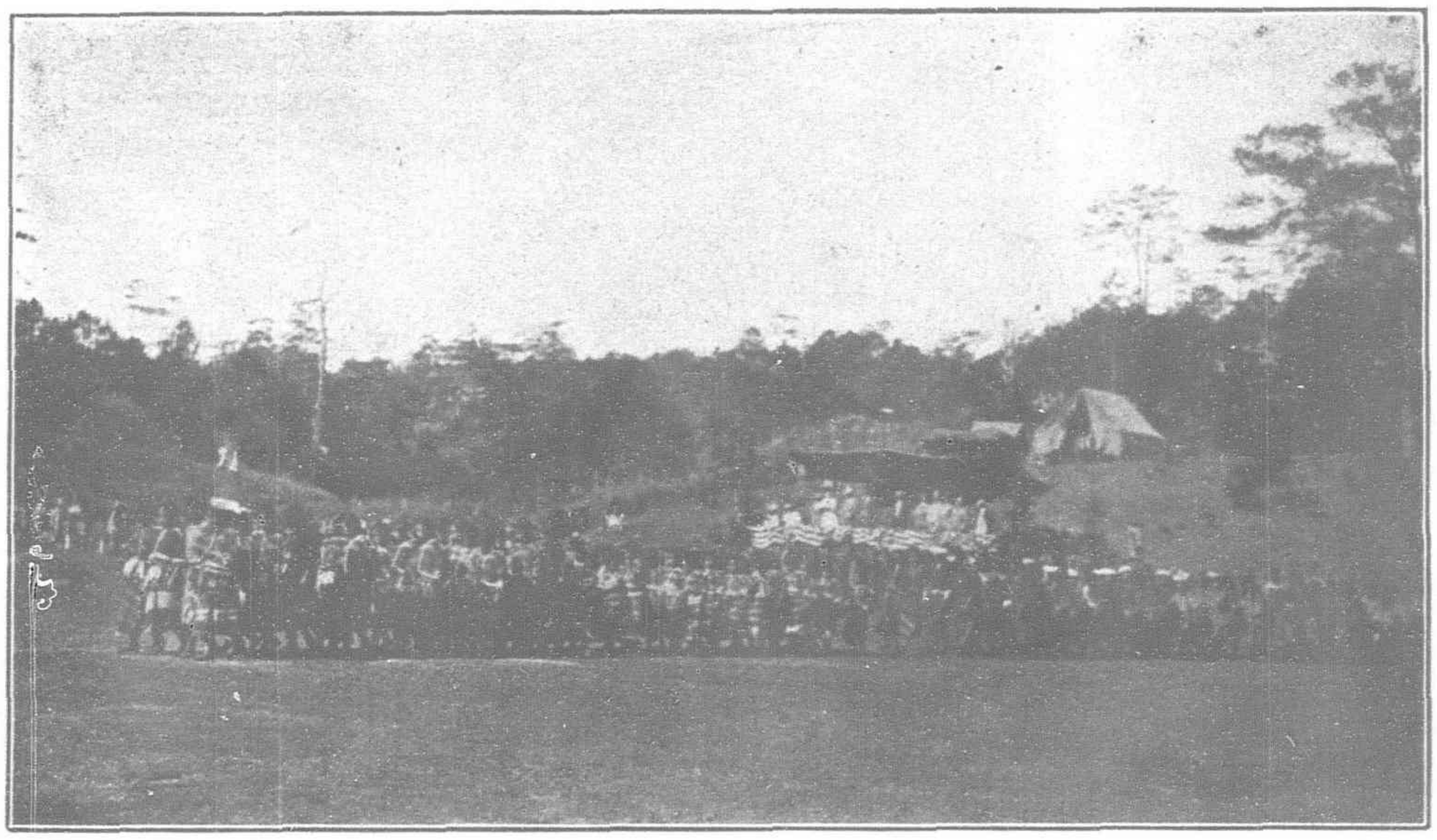
LOOKING THROUGH TEACHERS' CAMP, BAGUIO, 1910.



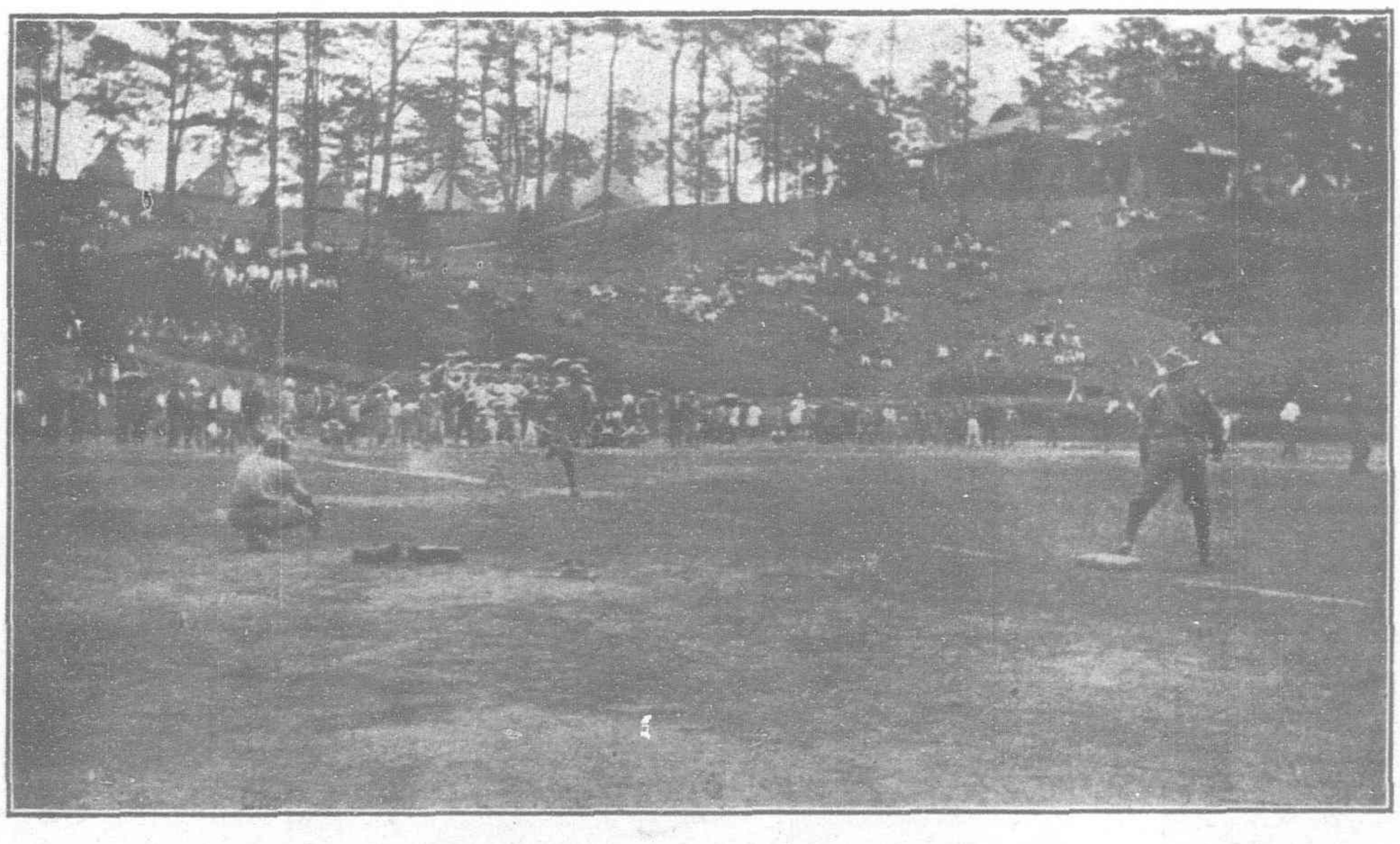
VIEW OF TEACHERS' CAMP, BAGUIO, 1911.



THE MESS HALL AT BAGUIO



PROCESSION OF MOUNTAIN PROVINCE SCHOOL GIRLS PASSING IN REVIEW AT BAGUIO ON CLOSING DAY OF ATHLETIC MEET



BASEBALL GAME BETWEEN TEACHERS AND "G—STRINGS" TEACHER'S CAMP, BAGUIO

square miles situated on a plateau in the province of Benguet at an elevation of about 5,000 feet. It is the center of what is termed the temperate zone of the tropical Philippines. The need of some place for recuperation during the heated term within easy distance from Manila was soon realized by the American administration and trips into the mountains in the Benguet region were indulged instead of a vacation abroad between February and June of each year. Governor Taft was greatly impressed with the vigorous climate of the Baguio region after a few visits and recommended that a wagon road be substituted for the trail so as to make the hills more easily accessible.

The undertaking to build the road through the hills proved a much more serious task than at first anticipated and at times there were doubts whether the heavy expenditure involved was warranted. Having put its hand to the plow the government refused to turn back and finally in 1905 the Benguet Road was completed under the supervision of Colonel Kennon, U. S. A.

In the meantime the members of the Philippine Commission had arranged to carry on their work in Baguio during the hot months. Temporary quarters were provided and a sanitarium established for convalescents and treatment of natives. The Hotel Pines was opened under private management and quite a number of residents of Manila joined the small official colony.

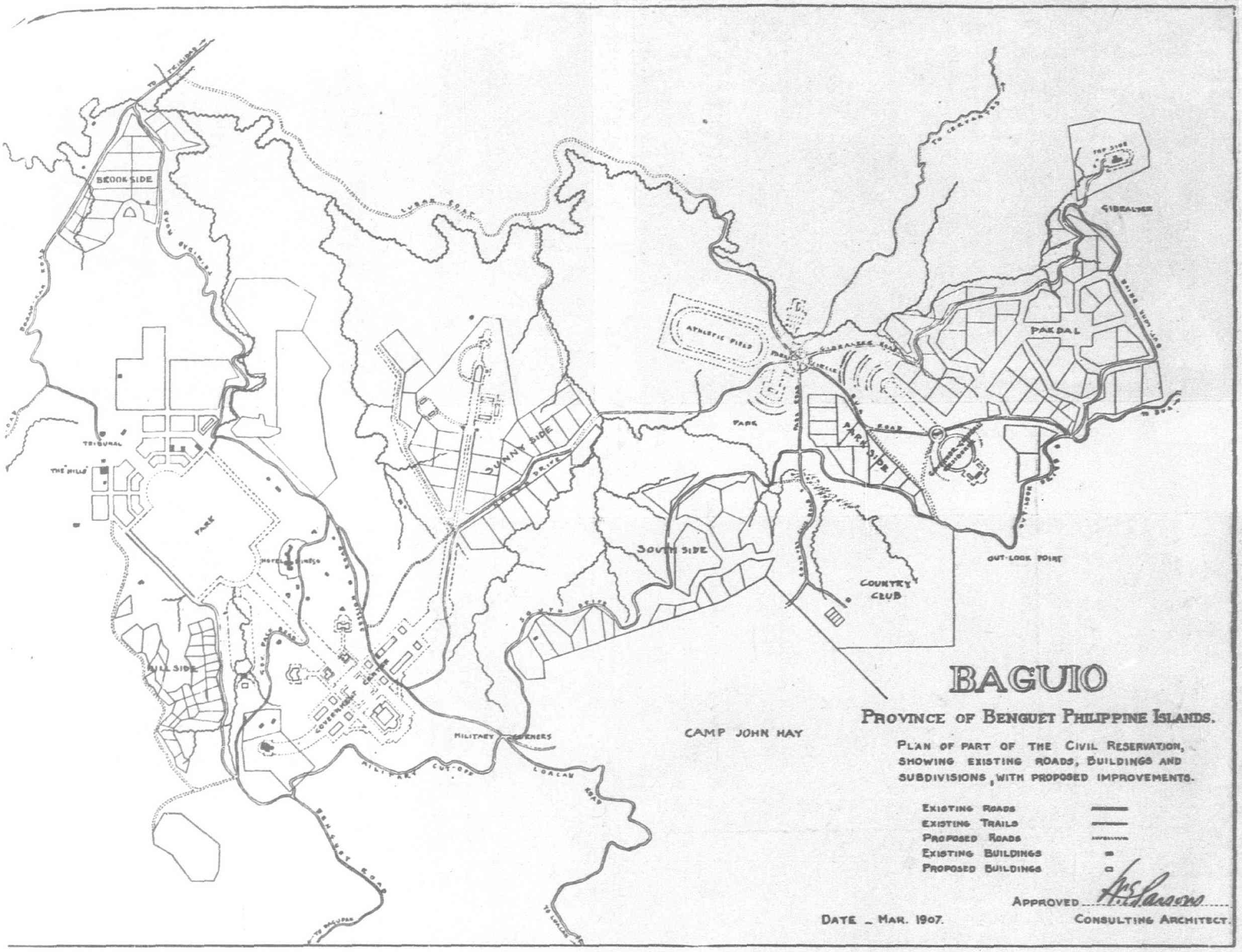
The military authorities also became interested. The tropics have serious deteriorating affect on troops and a retreat where patients might have the benefit of a temperate climate while convalescing appealed to them. The result was the purchase of a tract of 550 acres now known as Camp John Hay near the municipio of Baguio commanding one of the most delightful views of that region. With the co-operation of the military authorities, the Insular Government proceeded to enlarge its original plans so that Baguio might develop into a summer resort available to all classes. Plans were prepared for a model city; streets were constructed and lots were offered for sale at auction. While interest outside official circles was not marked at first owing to limited transportation facilities, it increased year by year until many Manila families now own summer residences at Baguio where formerly they sought relief abroad.

In the meantime the Manila Railroad Company extended its line from Dagupan to Camp One, a point on the Benguet Road about 21 miles from the Summer Capital and 142 miles from Manila by rail. Automobiles superseded mule transportation over the road. The cost of traveling from Manila to Baguio has been reduced from about ₱100 one way in 1901 to ₱27.50 for a round trip first class ticket good for six months; ₱23, second class; and ₱11 third class, in 1911. This remarkable improvement in transportation facilities had the desired result in attracting thousands of visitors where formerly there were but tens comprising the annual pilgrimage. The two hotels and temporary additions were filled to overflowing, while every available residence was occupied this year. Indeed, so great was the demand for accommodation that arrangements are now under way to double the hotel capacity for the 1912 season.

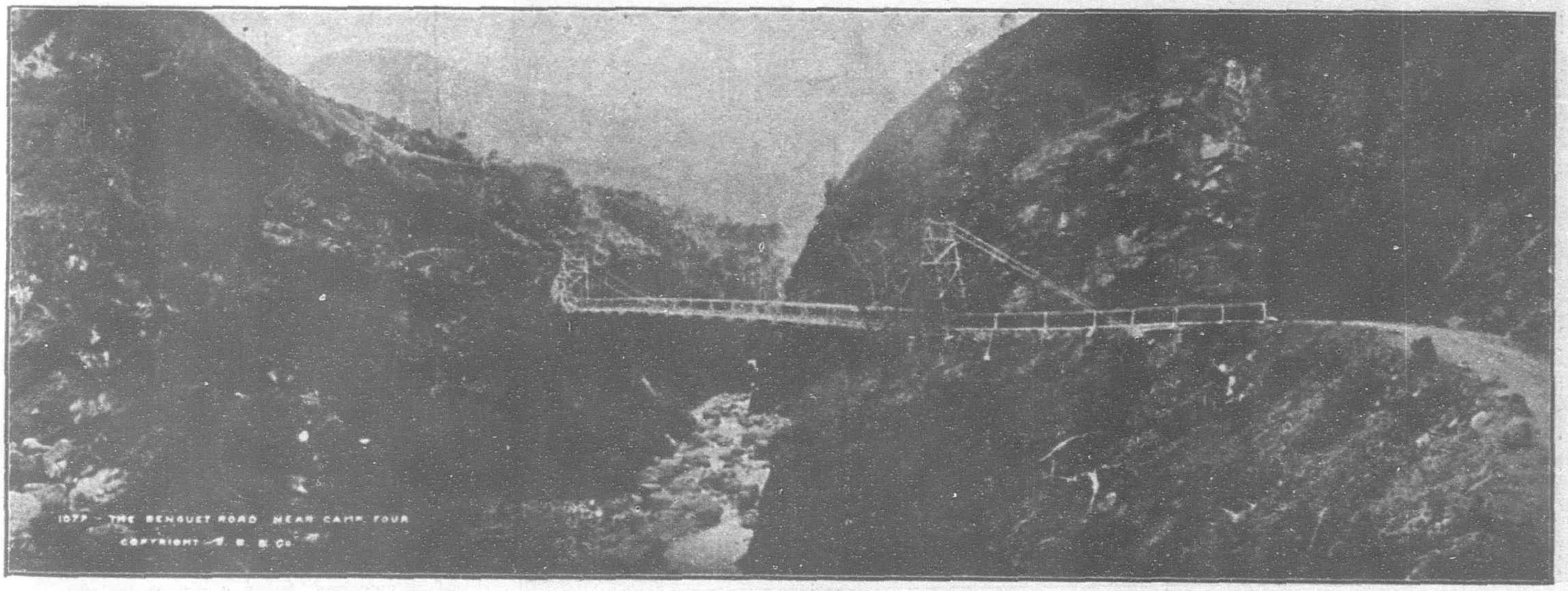
Baguio now boasts an electric lighting plant, a water supply, sewer system, telephone exchange and a taxicab service.

There are a number of handsome private residences, among which is "Top Side," built by Governor General Forbes, besides Mansion House, the Governor General's official residence while in Baguio. These two buildings are constructed of Benguet stone and finished largely in Banguet pine. At Camp John Hay a very imposing residence has been constructed for the Commanding General of the Division, with a row of officers cottages, military hospital and quarters for convalescents.

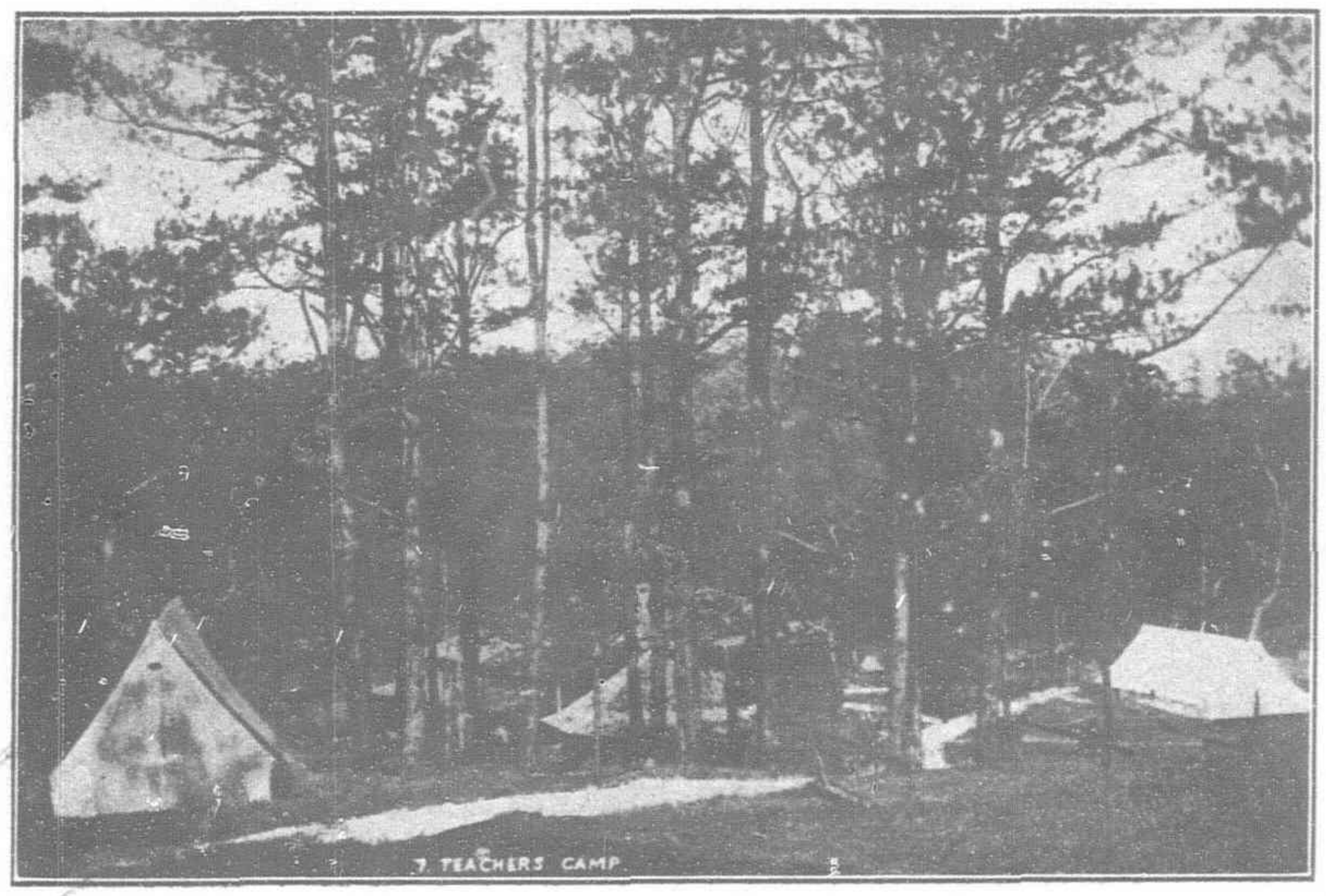
Government Center includes the administration building occupied by the secretaries of departments and the executive bureau with separate buildings for all the different bureaus of the insular government while a large



MAP OF BAGUIO SHOWING DEVELOPMENT AND PROPOSED PLANS UNDER DATE 1907, MANY OF WHICH HAVE BEEN CARRIED OUT



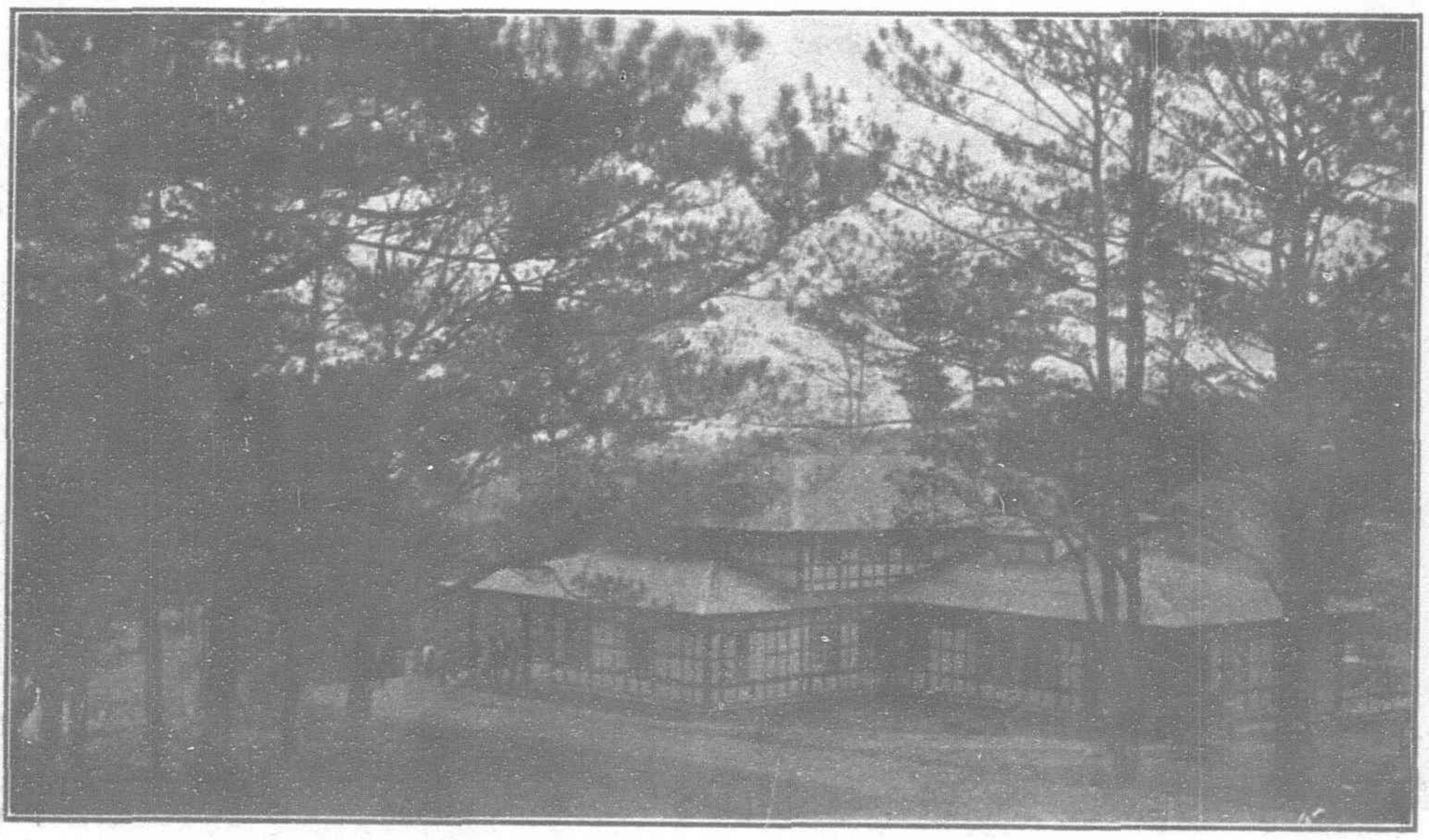
VIEW OF A TYPICAL SECTION OF THE FAMOUS BENGUET ROAD



ANOTHER VIEW OF TEACHERS' CAMP

BASEBALL AT TEACHERS' CAMP—HIS EXCELLENCY, GOVERNOR GENERAL FORBES AT THE BAT

VIEW THROUGH JAPANESE GARDEN UP THE VALLEY TO TEACHERS' CAMP BAGUIO



THE MESS HALL, TEACHERS' CAMP, BAGUIO

number of government cottages have been provided for officials and employes with a central mess hall maintained for their accommodation where board is secured at a nominal rate.

A large dormitory for government employes has also been established. Among other buildings constructed are the Constabulary school, the local weather station at Mirador, a new city hall, a new hospital and a municipal market, and the club house of the Veteran Army of the Philippines.

Among the educational institutions established is the Baguio Boys School, where the children of foreign residents have the benefit of a modern training in a bracing climate.

There are many points of interest within easy distance of Baguio and available either by automobile, as Trinidad Valley, or by trail to Mount Santo Tomas, Haight's place, etc., where excursion parties find opportunity for healthy outdoor exercise.

Among the most desirable features of Baguio is the Country Club with its splendid club house, its expansive, well kept grounds, including golf links, polo grounds, tennis courts, baseball diamond, etc., where outdoor sport in all its departments are encouraged. Governor General Forbes is an active exponent of healthy sport and it is due to his continued interest that the Country Club has proved such a success. Mr. Forbes believes that the Filipinos should be encouraged to development physically. During the summer season at Baguio, he may be found on the Baguio Home team or "rooting" for it with vigor from the bleachers.

One feature of the year 1911 was the large convention of teachers from all parts of the islands. Teachers' Camp, where the Assembly was located, was one of the great central attractions of the season and in no department was there more interest than in athletics. Teams from all parts of the islands vied with each other in base-ball, basket ball, etc. and a few local records were broken during the season. The different hill tribes had their representative champions and indeed there were few races not represented. This commingling of the races in healthy athletic competition is encouraged by the Government whenever possible and by this means much of local prejudice has been overcome.

Many visitors from other points in the Far East were attracted to Baguio during the present season and there is every indication that its beautiful climate will appeal more to residents of Oriental ports during the heated term.

For several years an effort has been made to interest capital in the construction of a railroad from some point on the Manila Railroad Co.'s line to Baguio. A line over the Benguet Road a distance of 21

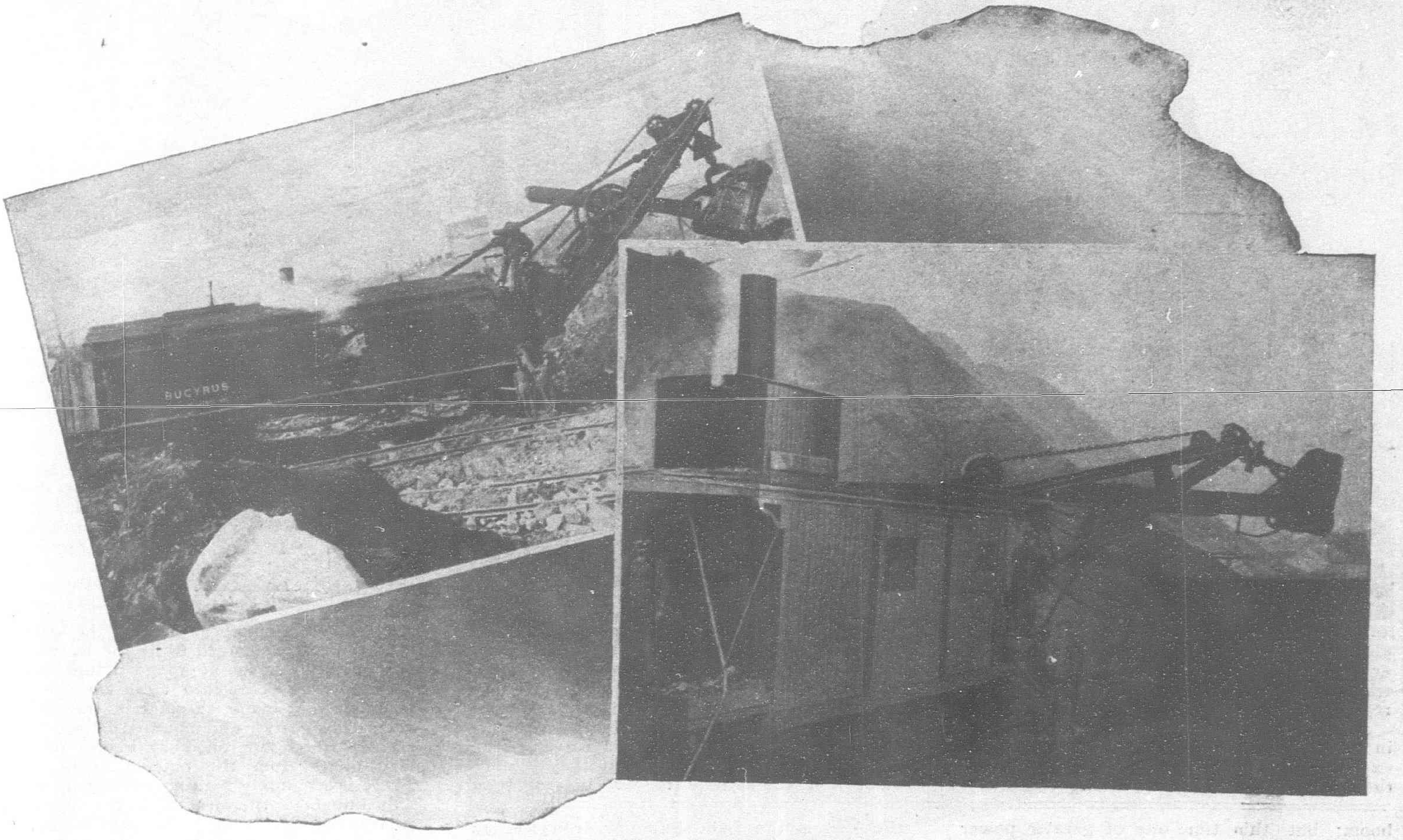
THE DEVELOPMENT OF THE STEAM SHOVEL

It was early in the last century that the steam excavator was introduced into the field of engineering. At this time it was but a crude machine, clumsy to operate, clumsier to move around and adapted only to digging earth and loose material. Since that day, however, owing to the tremendous advance that has been made in its development, mechanical excavating machinery has played a very prominent part in engineering. Indeed it is safe to say that there are many great projects that never would have been attempted without its use.

In European countries, England, France and Germany in particular, excavating machinery has been in use for some years but its development has not been rapid, the type remaining small and light. In fact in England at the present time the heaviest steam shovel built is a 36-¼ ton steam navy manufactured by the Ruston & Proctor Company. The Germans, however, have within the last few years turned out a few large and powerful machines, but it is interesting to observe that all modern developments along the line of power and size have emanated either directly or indirectly from the United States.

The American steam shovel through its 30 years of development has gone through many stages. The first excavating machine that can be classed under the general designation of "steam shovel" was built by the Pound Manufacturing Company of Lockport, New York in the year 1870. The body of the machine, including the mast, swinging circle, crane and car frame was constructed almost entirely of wood. It was mounted on broad wooden wheels of small diameter having a gauge of 10 feet. All the motions were controlled by one vertical engine. Whenever the shovel had to be moved any considerable distance it was necessary to take it apart and haul in wagons to the desired place where it was reerected. The next type to be developed was also equipped with small traction wheels of broad face. This machine had two engines, one operating the swinging and hoisting machinery and the other, a small oscillating engine, the movement of the dipper. Then came the first railroad shovel shown in the cut above. This particular machine was built dy the Bucyrus Company in 1882 and has been in use until the last few weeks. The most marked change in the machinery was the abandonment of the small inefficient oscillating engine for manipulating the dipper in favor of a friction clutch and sprocket chain operating from the train engine.

The next development was along the line of design rather than power. Until this time the shovel in general appearance was very much like the present English navvy. Now a steel boom held up by an A-frame or tripod replacd the old crane, a locomotive boiler took the place of the former type and finally, in answer to the demands of heavier digging, an engine again appeared on the



THE BUCYRUS STEAM SHOVEL

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miles from Camp One was first considered. Several surveys were made and recently preliminary location was completed by the Manila Railroad Company covering a route connecting Aringay, a point 25 kilometers south of San Fernando de Union on the Manila Railroad Company's main line, with Baguio, a distance of 61 kilometers. The survey carries the proposed line along the mountain range near the top of the divide so as to avoid serious landslides. The country to be traversed by the proposed railway offers many engineering difficulties due to the character of the country. The final location and estimates have not been completed, but it is understood are now being prepared.

The distance via Camp One to Baguio by present transportation is 263 kilometers and via the proposed through route over the Manila Railroad Company's lines 292 kilometers approximately.

In the meantime, the mining industry in Benguet near Baguio is slowly developing. Notwithstanding many drawbacks, serious damage by storms, and in some instances unwise direction, the presence of large deposits of gold in paving values has been fully demonstrated. There are now installed mills with an aggregate of thirty stamps besides the new twenty stamp mill of the Headwaters now being installed. While the output of gold has fallen off, it is not due to disappointment in values but to the destruction of active plants by storms and the lack of capital to restore them. This industry in Benguet has a great future before it under wise direction and will surely justify every effort put forth to give that section desirable transportation facilities.

The soil and climate is attracting agriculturalists interested in the cultivation of temperate products and with a market easily available, there seems a future in this line of endeavor.

The average temperature in Baguio is 75° maximum and 51° minimum. In December and January, the thermometer drops to the freezing point and there are few evenings when a fire is not welcome.

It is the firm purpose of the Government to increase the accommodation for government employes from year to year, so that ultimately the great majority of them may enjoy the benefits of the climate annually. The Government claims it pays. The improved physical condition of the members of the service gives returns in the form of better service and a greater degree of contentment. In addition Baguio provides a general health resort for the islands, which, as facilities for transportation are increased will put the benefits of the climate within reach of all.

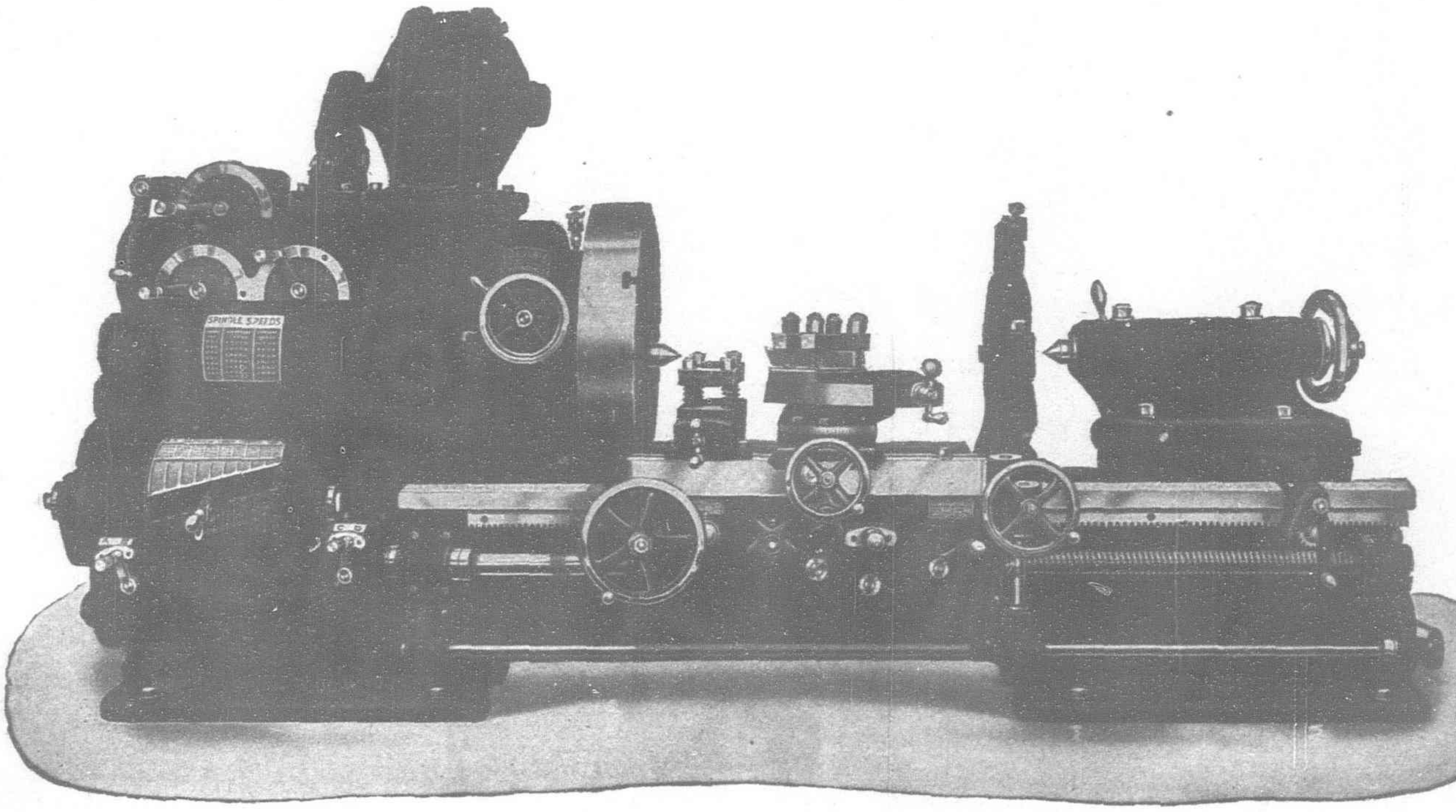
The views of Baguio and Teachers' Camp in this number are reproduced by courtesy of the *Teachers' Assembly Herald*.

AMERICAN HIGH DUTY LATHES OF NEW DESIGN

The illustrations accompanying this arti' cle are those of the 42 inch "American'-High Duty Lathes manufactured by the American Took Works Company of Cincinnati, Ohio, whose high standard machinery enjoys a worldwide reputation.

The machines referred to are the very latest and highest developments in high duty lathes and the manufacturers claim that there never has been a similar sized lathe produced which can be compared with these lathes in regard to power, range and convenience.

Although these machines are strictly new in design the are by no means still in the experimental stage. In fact, where installed they have more than exceeded expectations.



As implied above, in power, range and convenience these new lathes are in advance of all similar size lathes of previous design and one of these tools will prove a very valuable asset in every shop in which large lathes are used.

Some idea of their enormous power may be gained from the fact that for a moter driven machine the manufacturers recommend a 20 H. P. Motor and guarantee the lathe to work without strain under continuous service of 50% overload of the motor and also from the fact that with the countershaft speed given on a belt driven lathe the speed reduction between the countershaft and the spindle is far greater than on any other similar machine. A constant speed motor is advantageously used for 16 spindle speeds are regularly provided. If, however, a variable speed motor is preferred a speed variation of only 35% will be required.

The 16 spindle speeds are all obtained through a medium of positive clutches and slip gears the clutches being of the selective type and easily engaged while the teeth of the slip gears are machine rounded thus causing them to slide easily into mesh on the same principle as many automobile transmission gears. The gears are all mounted on long bronze sleeves which are oiled by means of eight feed oilers from the outside of the head. There is absolutely nothing which will require adjustment in the headstock, the only attention necessary, being occasional oiling. Of the 16 speeds provided 8 are obtained directly through the spindle gear and the other 8 through the face plate drive. This is a distinctive point of these machines as in the usual type of triple geared lathes only ⅓ of the speeds are obtained through the face plate drive. This later type necessitates using the spindle gear drive for a great deal of heavy turning on large diameter work which on this lathe is handled through the face plate drive thus relieving the spindle of the enormous strain.

In regard to the detailed construction of the head, all driving is done either through shorth shafs or through sleeves, there being no long shafts in torsion at any time thus eliminating all possibility of binding or chatter. All gears in the driving mechanism are of unusually coarse pitch and wide face and the pinions are made of steel cut from the bar. The gears have ample strength for far in excess of any strains which may be placed upon them.

Another very important point in connection with the head construction is the elimination of all loose gears from the spindle. The spindle is made in taper form, a construction common to heavy wheel lathes. The only gear on the same is the spindle driving gear which is set close against the front spindle bearing. The spindle is therefore at no time under severe torsional strain. This feature adds greatly to the life of the bearings and the alignment of the spindle itself. The bearings throughout the head are all bored out from the solid and are lined with massive phosphor bronze bushes. This also applies to the entire feeding mechanism

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boom; but this time one of greater power and efficiency.

From now on the applicability of the shovel to new fields became recognized as it came to the used in heavier and more refractory material. Steel took the place of iron in various vital parts and others were enlarged and strengthened to cope with new conditions.

Thus the development continued until several distinct types came in vogue: the small revolving shovel for light road, cellar and small brick plant work; shovels of from 40 to 70 tons for railroad construction and the ordinary run of digging; the 80 ton for heavier work of this class and shovels from 95 to 11 otons for open cut iron and copper mines, rock and cement quarries and work where unusually severe conditions are encountered or particularly large output required.

The Panama Canal is undoubtedly the best instance of the use of modern excavating methods. Here there are 100 steam shovels in use, 47 of which are of the heaviest and most powerful type. On account of the very accurate records kept it is particularly interesting to note the outputs recorded in material which is considerably harder than the average. The daily record is now held by a 95 ton shovel built by the Bucyrus Company of South Milwaukee, Wisconsin, which furnished 77 of those on the Isthmus. This machine in eight hours dug 4823 cubic yards of material designated as rock and earth, although delayed 160 minutes waiting for cars and for other reasons. More remarkable performances are frequently reported by contractors but the above is mentioned as it is strictly official.

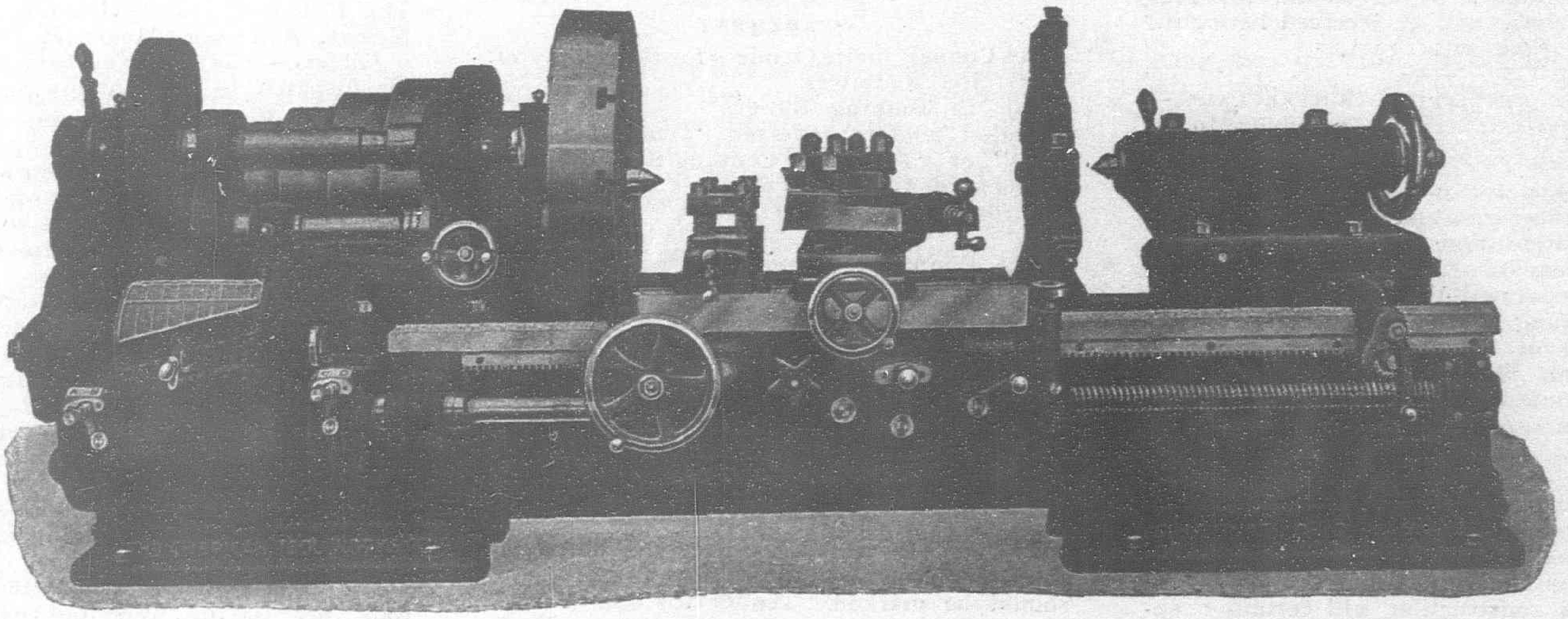
There are many examples of the extensive use of shovels for mining work. Perhaps the best is the Lake Superior Iron Ranges located in the northern part of the United States. Here there are several hundred engaged in stripping the over-burden and digging the ore. The Rio Tinto Mine in Spain, the greatest open cut copper mine in the world is operated by 15 Bucyrus shovels, and even above the Arctic Circle in northern Norway Bucyrus 95's are mining iron ore. The Rock Industry is the last to find the use of steam shovels not only economical but necessary. What with the severe strains imposed by digging blasted and some times almost solid rock it is here that the shovel meets the hardest possible conditions and perhaps it has here reached the highest point of development.

By far the greatest user of the steam shovel, however, is the railroad contractor. He generally starts business with teams, wagons and scrapers and picks up small light work not adapted to heavy machinery. His aim, however, is eventually to purchase a steam shovel, a small locomotive and a few dump cars. He is then in a position to bid on contracts and if successful to invest in more equipment. Indeed there are many contractors who find it profitable to own upwards of 20 shovels each costing between $9,000 and $9,500.

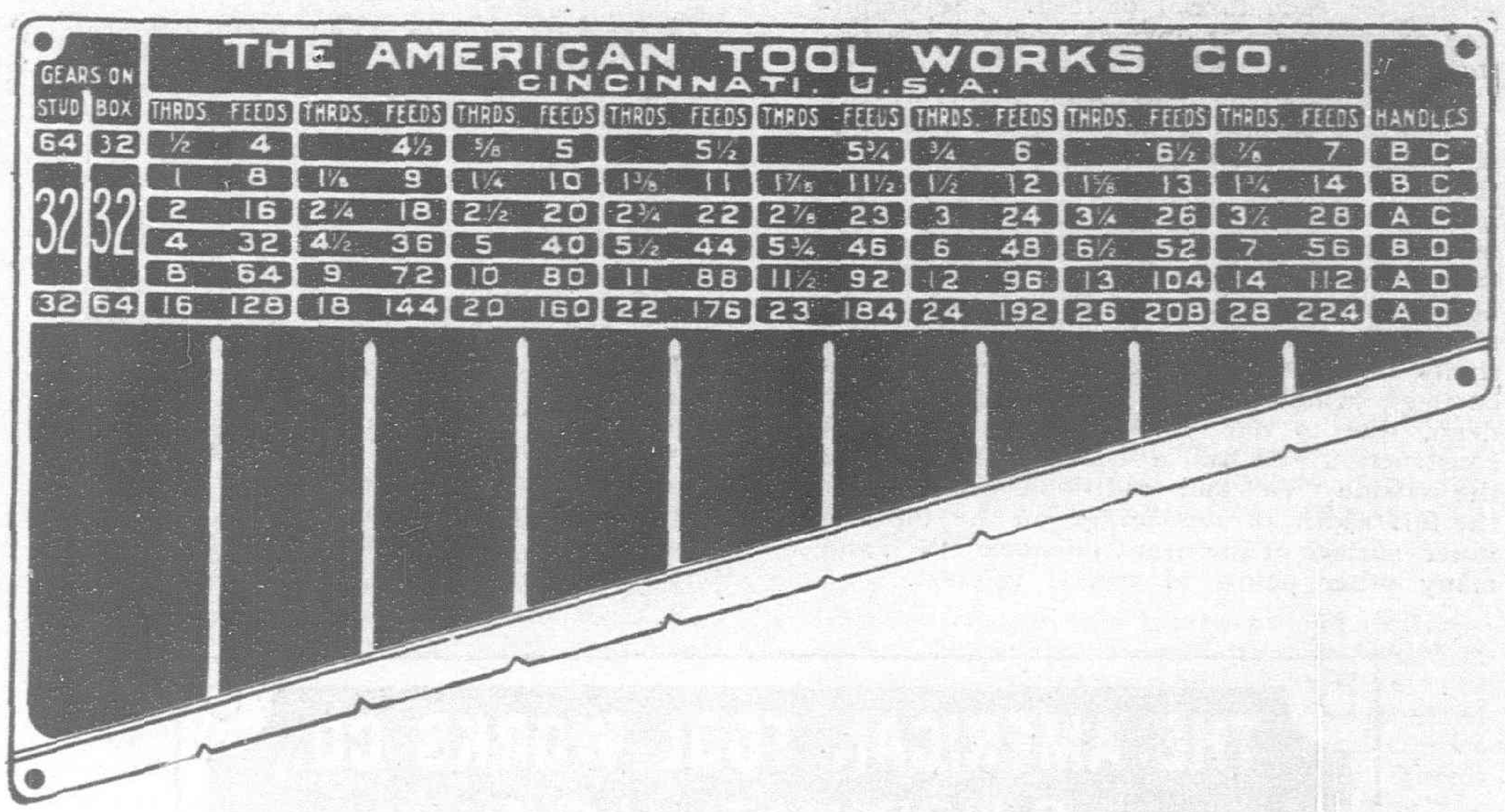
It has been said that "necessity is the mother of invention". In the case of the steam shovel its "mother" may be considered the high scale of wages. It is this force which has existed in the United States to such an extreme degree which has, more than anything else, brought the steam shovel to what it is today, and although the same conditions may not exist in other countries to lend an impetus to its use the steam shovel has effectively established itself once for all as an economic tool.

and all the bearings throughout the machine are of a high grade phosphor bronze.

Another point which has been very carefully worked out, is the construction of the driving pulley which is mounted on a steel sleeve of large diameter. The pulley is bronze bushed and runs on the steel sleeve thus relieving the driving shaft of all pull from the belt. The pulley is also self-oiling, the hub of same forming a retainer for the oil-which is fed to the shaft through felt wipers. With this construction a circulation of oil is continually taking place with the result that fresh oil is being constantly fed to the shaft.



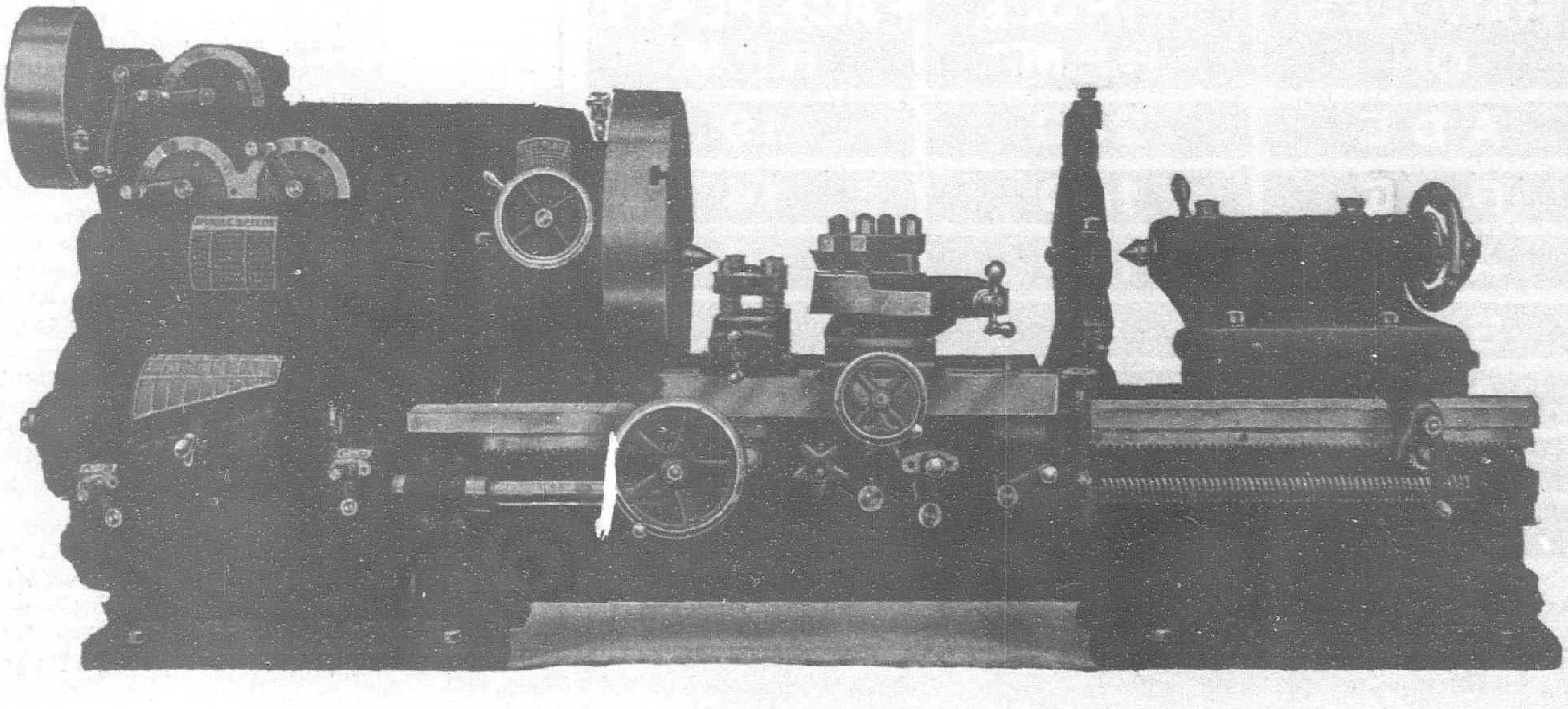
All speed changes can be made without stopping the initial drive as the machine may be started, stopped and slowed by means of a friction clutch which engages and disengages a driving pulley or motor gear from the shaft. This clutch is operated by a lever shown at the right hand side of the pulley. The control is very sensitive thus enabling the operator to quickly make the various speed changes. The positions of the lever for the various spindle speeds are plainly indicated on the index plate on the front of the head. This plate has been very carefully worked out and every lathe operator will appreciate its simplicity and the ease with which each spindle speed is obtained. An illustration of the index plate is shown herewith.



THE AMERICAN TOOL WORKS CO.
CINCINNATI, U.S.A.

GEARS ON STUD	BOX	THRDS.	FEEDS	THRDS.	FEEDS	THRDS.	FEEDS	THRDS.	FEEDS	THRDS.	FEEDS	THRDS.	FEEDS	THRDS.	FEEDS	THRDS.	FEEDS	HANDLES
64	32	½	4		4½	⅝	5		5½		5¾	¾	6		6½	⅞	7	B C
32	32	1	8	1⅛	9	1¼	10	1⅜	11	1⅞	11½	1½	12	1⅝	13	1¾	14	B C
		2	16	2¼	18	2½	20	2¾	22	2⅞	23	3	24	3¼	26	3½	28	A C
		4	32	4½	36	5	40	5½	44	5¾	46	6	48	6½	52	7	56	B D
		8	64	9	72	10	80	11	88	11½	92	12	96	13	104	14	112	A D
32	64	16	128	18	144	20	160	22	176	23	184	24	192	26	208	28	224	A D

One of the most notable features of these new lathes and one upon which great emphasis is placed is the Rapid Change Gear Mechanism, All gears in which are steel. The material used in the gears is the very best obtainable, being either of bar steel or drop forgings. This mechanism is embodied in a self-contained unit carried on the front of the bed and provides 32 fundamental changes of threads ranging from 1 to 14 per inch. In addition to this a compound quadrant gear is provided on the end of bed which will furnish 16 additional changes thus affording 48 thread and feed changes ranging from ½ to 28 threads including 11½ pipe thread and from 4 to 244 cuts per inch. The 32 changes in the box are all obtained through the medium of a cone and tumbler gear and two sliding clutches of the selective type. Anyone of these changes may be instantly obtained while the machine is running. The quadrant mentioned also



CONTRACTING NEWS

PROPOSALS INVITED

PROPOSALS FOR WOODEN LORCHAS.—Headquarters Philippines Division., Office of Chief Quartermaster, Manila, P. I., June 3rd, 1911, Sealed proposals, in triplicate, for constructing and delivering to the Quartermaster Department, U. S. Army, four (4) Wooden Lorchas, will be received here until 11:00 a. m., June 26th, 1911.

BUREAU OF PHILIPPINE CONTABULARY.—Sealed proposals, in triplicate, subject to the usual conditions, will be received at the office of the Chief Supply Officer, Bureau of Constabulary, until ten a. m., November 1, 1911, for furnishing the following articles:

200 Capes and Hoods, khaki, for officers.

MUNICIPALITY OF SHANGHAI—ELECTRICITY DEPARTMENT

The Council invites tenders for the supply of:

(a) 100 Radiators
(b) 12 Cooking Ranges

Sealed tenders endorsed "Tender for Radiators" or "Tender for Cooking Ranges" must be forwarded to them not later than noon on Saturday, July 15, 1911.

The Council is prepared to receive LAND CEMENT in such quantities as may be required during the year beginning on September 1, 1911.

Sealed tenders will be received not later than noon on Saturday, July 8,911, and should be marked "Tender for Portland Cement."

The Council is prepared to receive tenders for the supply of 12 tons of COIR YARN in varying qualities.

Sealed tenders will be received not later than noon on Saturday, July 8, 1911, and should be marked "Tender for Coir Yarn."

BIDS OPENED AND CONTRACTS AWARDED

MUNICIPALITY OF SHANGHAI ELECTRICITY DEPARTMENT

Three-phase Motors.—The Electrical Engineer having reported that within a few months the new 3-phase power supply will be available in the Northern and Western Districts, and with a view to keeping a supply of 3-phase motors available, specifications were forwarded as an urgent matter to all the firms who tendered in response to Notification No. 2075 of December 8, 1910, Single-phase Motors.

Upon the recommendation of the Electricity Committee orders have been placed as follows:—

One 60 H. P. motor manufactured by Allgemeine Electricitats Gesellschaft, Berlin, speed 585 revolutions per minute, Messrs, Arnhold, Karberg & Co. £111.

Two 60 H. P. motors, manufactured by Messrs Bruce, Peebles & Co. Ld., Edinburgh, speed 585 revolutions per minute, Messrs. Brighten, Malcolm & King, Ld. £246.10.0.

Two 50 H. P. motors, manufactured by Siemens Schuckertwerke, Berlin, speed 730 revolutions per minute, The Siemens China Electrical Engineering Co., £156.

Three 30 H. P. motors, manufactured by The British Thomson-Houston Co, Rugby, Messrs. Andersen, Meyer & Co. £145.10.0.

Indents.—The following have been approved for dispatch to the London agents:—

No.	Firm	Article	Approximate cost.
906	Crosby Lockwood & Son	Engineer's Year Book	10s. 6d.
907	British Elect. Transformer Co.	Repairs to transformer	£30
908	—	875 meters	£1,210

Coal Supply.—Of seven tenders received in response to Notification No. 2101 for the supply of coal for the Electricity Department during the year ending April 30, 1912, that of Mr. J. H. Johnsen has been accepted for Shinkoyanose Coal. at the rate of Tls. 5.15 per ton.

U. S. QUARTERMASTER'S DEPARTMENT.—1,000,000 pounds of reinforcing steel. Tenders follow:

For 20,000 pounds of quarter inch round rods, per 100 lbs., Wise and company, ₱3.44; W. F. Stevenson and company, ₱3.70; Findlay Richardson ₱3.6482; Ker and company, ₱3.363 for American steel; American Hardware and Plumbing Company, ₱3.7134; Atlantic Gulf and Pacific company ₱3.38.

For 400,000 pounds of half inch round steel rods. Wise and company, ₱3.43 per 100 lbs.; W. F. Stevenson, ₱3 335; Findlay Richardson, ₱3.2784; Ker and company, same price as for other steel; American Hardware, ₱3 3064; Atlantic Gulf and Pacific, ₱3.33; for 300,000 pounds of half inch square steel rods; Wise and company, ₱4.06 per 100 lbs.; W. F. Stevenson, ₱3.335; Findlay Richardson, ₱3.-2784; Ker and company, same as other bids, Atlantic Gulf and Pacific, 3.33.

For 80,000 pounds of one inch round steel rods; Wise and company, ₱3.44 per 100 lbs.; W. F. Stevenson, ₱3 135; Findlay Richardson, ₱3.2784; Ker and company, same as other bids; Atlantic Gulf and Pacific ₱3.33. For 200,000 pounds of one inch square steel rods; Wise and company, ₱4.06; W. F. Stevenson, ₱3.335; Findlay Richardson, ₱3.2784; Ker and company, the price as their other bids; Atlantic Gulf and Pacific, ₱3.33.

U. S. MARINE CORPS, PHILIPPINES.—Food Supplies—Awards covering an approximate value of ₱200,000 were as follows:

Castle Brothers-Wolf and Sons, crate bacon, canned bacon, mackerel, cornmeal, rice, onions, potatoes, hops, vinegar, lard, syrup, fresh butter, and lemon extract; John Rothschild and company, salmon, prunes, apples, peaches, jam, coffee, sugar, Ceylon tea, pickles, salt, pepper, ground cinnamon, cloves, ginger, nutmeg, and vanilla extract; William H. Anderson and company, canned baked beans, flour, canned butter; Connell Brothers, dry beans, canned tomatoes, evaporated milk.

MANILA HOTEL COMPANY

The following bids were opened and awards made—1600 pieces narra furniture.

R. M. Loper offers to supply the furniture for ₱55,700, while the Export and Import Lumber company bid ₱54,982,06.

Wm. H. Anderson and company, Philippine representative for the Brunswick Balke Collander company, have secured the contract for furnishing pool and billiard tables and equipment for the Manila hotel.

FURNISHING CEMENT FOR SIX MONTHS ENDING DECEMBER 31, 1911— Philippine Bureau of Supply—Contract awarded Messrs. Wm. H. Anderson & Co., Green Island Emerald Brand ₱4.50. The other bits were: Alsen ₱4.48, and Haiphong ₱4.59½.

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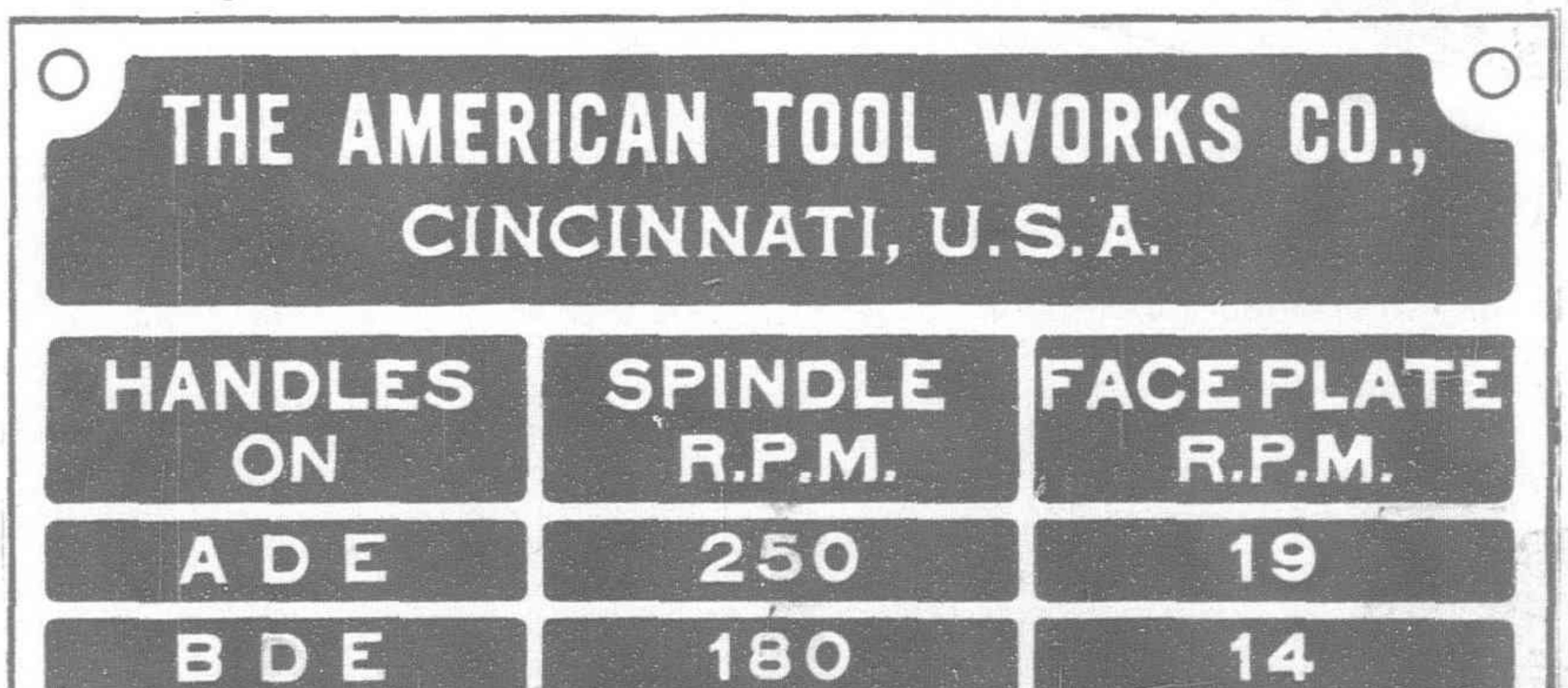
provides means for obtaining through the medium of loose gears any odd rates or feeds which may from time to time be desired. The cone gears are all of the Brown & Sharpe 200 involute pointed type which provides an especially strong tooth and greatly facilitates the engaging of the gears while running. *The One Great Feature Of This Quick Change Mechanism which is Distinctively Superior and can positively not be found on any other design is that which eliminates the necessity of speeding up any time for any of the different feeds or threads.* The coarse threads and feeds are all obtained through the cone, and no member in the box does at any time run faster than the initial driving gear. The value of this construction will certainly appeal to every person interested in and familar with lathes. The index plate completely worked out, is in full view of the operator on front of the gear box showing the exact setting for each thread or feed. The simplicity of this place is obvious from the illustration shown herewith.

There are a great many other points worthy of mention especially the couble wall construction of the apron, the ability to draw the rack pinion from the feed rack when cutting threads, the impossibility of simultaneously engaging the feeding and screw cutting mechanism, all gears and pinions in apron being of steel and being cut from the solid with special cutters, the studs and shafts hardened and ground, the extra heavy carriage which is 13" wide and unusually deep, due to our patented drop "V" bed construction and has a bearing of 50½" on the outside "Vs" and additional bearings for the full width of the bridge on the top and inner surface of the front tailstock "V"; and many other points of special interest.



THE AMERICAN TOOL WORKS CO.,
CINCINNATI, U.S.A.

HANDLES ON	SPINDLE R.P.M.	FACE PLATE R.P.M.
A D E	250	19
B D E	180	14
A C E	130	10
B C E	95	7
A D F	70	5½
B D F	50	4
A C F	36	2¾
B C F	26	2

FAR EASTERN RAILWAY NEWS

The Hu-Kuang Railway Loan Agreement.—A dispatch from Peking under date of May 21 announced the conclusion of the loan of £6,000,000 bearing interest at 5% equally divided among the four powers interested. The proceeds are to be utilized for the completion of the Canton-Hankow and the Hankow–Szechuen trunk lines. According to latest advices the lines to be constructed covered by the loan aggregate about 1300 miles of which 600 approximately represents the balance of the Canton-Hankow trunk. From Hankow to Ichang 400 miles, and from Ichang to Kweichow (Szechuen) 300 miles, comprise two sections of the Szechuen line. A British engineer will be in charge of the Canton-Hankow section; a German on the Hankow-Ichang section and an American on the Ichang-Kweichow. The construction involved is expected started within six months and all the lines with the exception of the Ichang-Kweichow are to be completed within three years. The loan runs for forty years and is secured by the revenues of the different provinces through which the lines pass. The agreement also provides for an additional £.4,000,000 loan if required.

New Railway Depot at New Wiju.—It is proposed to build a new station at this point to cost 250,000 Yen.

Japan Participates in Continental Railway Union—At the recent convention at Brussells the Japanese delegates secured the privelege of participation and a union ticket service will be available from September when tickets will . be issued at Shimbashi, Hiranuma, Kyoto, Osaka, Kobe, Nagasaki, Shimonoseki and Moji stations to all parts of Europe.

Rolling Stock for the Kirin—Changchun Railway.—The *Peking News* announces that the Tongshan Railway Shops are constructing the following for this line: six 17 by 23 cylinder Mogul engines; six tenders; two shunting engines; one private car; four composite cars; six brake vans; six 30 ton covered goods vans; twenty 30-ton low side cars; twenty 30-ton high side cars. Also a number of various goods cars are under construction. The following have already been delivered:—One shunting engine; twenty 30-ton low side cars; one tender; six brake vans. The same paper also contains this telegram from Mukden, dated May 24:—One locomotive, one tender, ten 30-ton cars and brake vans have gone forward from here by the South Manchuria Railway to Changchun. The entire stock went away without a hitch.

South Manchuria Railway Insurance.—Ten leading fire insurance companies have agreed to cover freight risks in the warehouses of the company at Yinkow, Mukden, Tiehling, Kaiyuan and Szupingchieh at an ordinary rate of one per cent to a maximum value of 8,000,000 yen and to the value of 5,890,000 yen covering goods on Dairen wharves.

Korean Railways.—It is expected that the line connecting Taichon and Kuasan, Korea, will be open for general traffic by April next year.

European Connections With Peking.—A proposed scheme is reported underway to construct a direct line of railway connecting Paris with Peking so that St. Petersburg would be but 7½ days journey from the Chinese capital, Berlin 9 days, and Paris, 9½ days. No definite information about this proposed project is at present available.

The Kowloon-Canton Railway.—The total receipts of the British section for April amounted to $12,162.50 Mex. of which the fares amount to $10,919.59 and the freight receipts were $1,243.59.

Siberian Railways.—Single track railways in South Siberia and Altai province have been proposed by the Russian Minister of Communications. The South Siberia line will start from the southern frontier of Altai Railway and connect with Nicholaisk and other Siberian points.

Japan's Light Railways.—Since the light railway subsidy law came into operation in August says the *Japan Times*, the charters obtained up to the middle of March reach a total of forty-seven, the lines contemplated extending for 827 miles at a cost of 38,936,000 *yen*. During the six weeks ending April 30th the light railway companies which obtained charters numbered eleven, the lines under contemplation reaching 146 miles, and the cost of construction being estimated at 5,195,000 *yen*. Besides the above other companies awaiting charters number over fifty. Of the companies which have already received charters, those whose cost of construction are estimated at over 1,000,000 *yen* number fourteen. Among these is the Bando Light Railway, which has under consideration a scheme for building 59.23 miles between Hachoji and Omama at a cost of five million *yen*.

Manila Railway Co.—The survey of a proposed line to connect Baguio with the northern trunk line of this company at about 35 kilometers south of San Fernando has been completed and estimates prepared. The completion of this branch will give direct railway connections between Manila and the Philippine summer capital.

Philippine Railway Guarantee of Interest on Bonds.—A bill is now before congress providing for an amendment to the requirement in the original authorization that the issue of guaranteed bonds would only be made on 20 miles of completed line, so that in amended form the issue will be authorized on six miles of line.

Shensi-Honan Railway.—The earthwork for a distance of 26 miles from Luyang in Honan is reported completed and bridges and stations are being built along the route. The line will be 160 miles long when completed.

The Largest Locomotive.—Engineering News describes the engine that holds for the present the record as a Mallet engine of the 2-10-20-2 class for handling 2,000 ton freight trains on long and severe grades.

The total weight of the engine is about 616,000 lbs., with 550,000 lbs. on the driving wheels (55,000 lbs. per axle), while the loaded tender (on six-wheel trucks) increases the total weight to 850,000 lbs.

The boiler is made in two sections united by a rigid separable joint. Beyond the smokebox is a tubular section 9 ft. long forming the superheater; this is divided into two compartments, one for superheating the live steam, the other for reheating the high-pressure exhaust on its way to the low-pressure cylinders. The firebox is of the Jacobs-Shupert type, without staybolts. The firebox proper and outer shell are each composed of pressed-steel channels, bent to horseshoe shape and riveted together through the flanges; transverse stay-plates or diaphragms of horseshoe shape are fitted between the two sets of channels, and are perforated to permit of free circulation in the water legs and over the crown.

These engines are notable for the size of their tenders, which are mounted on six-wheel trucks and have a total weight of 234,000 lbs. (including water and oil fuel). They are practically identical with those of the 4-4-6-2 Mallet passenger engines.

Three of these huge engines have been built at the Topeka shops of the Atchison, Topeka & Santa Fe Ry. by combining pairs of the 2-10-2 engines which have been a characteristic type on this road for some years. An order for ten new engines has been given to the Baldwin Locomotive Works.

Opening of the Chuo-Line.—An interesting ceremony at Nagoya featured the opening of this Japanese line connecting Hachioji and Nagoya, a distance of 224 miles representing an outlay of Yen 35,000.000 and fifteen years effort. According to the Kobe Herald there are 95 tunnels of a total length of 113,378 feet. The expenditure on the tunnels per foot is estimated to be -Y-91.25. The tunnel on Sasago Pass is 2 miles and 71 chains long; this is the longest tunnel in Japan. There are 350 bridges on the line, their total length being 24,265 feet, the cost per foot being -Y-170.68. The Torii tunnel is situated 3,189 feet above sea level, which is the highest point reached on any Japanese railway. There are 506 small bridges and 47 stations on the line. In short, the Chuo line traverses mountaneous and hilly country almost exclusively and in consequence the work of construction was very difficult.

The Ichang Wanhsien Railway—Referring to the progress made on this railway the *Peking News* states that there are 30,000 men employed; construction trains are working out of Ichang for several miles; one tunnel 1000 feet long has been pierced and another 6000 feet in length is under way. The earthwork is well up to Kweichow for a distance of 100 miles. At Ichang several hundred acres of land have been raised, numerous godowns, machine shops and station buildings erected, and a certain amount of bunding done at the wharves. The line runs inland from Ichang and comes out at the Yangtse river near Hsiang Ch'i, about 90 miles distant; it then follows the river for some 30 miles, when it will go inland again along a route which has not yet been finally determined upon. The country to be traversed is very mountainous, and it is estimated that the section to Wanhsien will take some 15 years to complete.

Kirin—Chanchun Railway—The estimated outlay for the current year is placed at yen 500,000 covering road and building construction and rolling stock. It is estimated that there will be a force of 50,000 coolies steadily employed during the year. A temporary mountain line is proposed over the Tumenling Pass to be used until the tunnel there is completed. Seventy per cent of the earthwork is reported completed and it is expected that the rails will be laid to Kirin by the end of the year. At present there are now in operation of the line 2-78- ten and 2-38 ton locomotives, 70 construction cars, 10-30 ton freight cars supplied from the Tongshan Shops.

Supply of Railway Material.—Messrs. J. Reid and Co., Ld., England, have received and order for the supply of 500 cwts. of pig lead and 1,300 cwts. of white lead to the East Indian Railway.—The Anderson Foundry Company, Limited, have a large contract for the supply of 92,610 tie bars with cotters and keys to the same line.—The Vacuum Brake Company, Limited, London, have completed a large order for the supply of their vacuum brake fittings for rolling-stock to the Burma Railways.—Messrs. Glenfield and Kennedy, Kilmarnock, have supplied this line with five sets of washing—out apparatus for locomotive engines and Messrs. J. Blakeborough and Sons, Limited, seven 6-inch pillar water cranes for locomotives —The Burma Railways have placed an order with the Metropolitan Amalgamated

PHILIPPINE MINING NEWS

THE PARACALE DISTRICT.—During the month there has been unusual interest aroused in the proposed consolidation of a number of valuable placer properties in this section and the progress of negotiations with a group of Melbourne capitalists in connection with the development of this consolidation.

Mr. A. Burlingame Johnson of Manila has taken an active part in this new mining project. He secured an option on the ground being worked by the Paracale Gold Dredging Co. under a long lease. This ground includes about 500 acres and the progress made in the development has long been unsatisfactory to the owners. We understand that some sacrifice was made by the owners in order that the lease might be purchased by the promotors of the consolidation. Mr. Johnson recently returned from Melbourne accompanied by a representative of Melbourne capitalists and an expert and an examination of the property is now being made. If the report is satisfactory active operations will begin at once. It is understood that negotiations are also under way to include the Paracale Extension and the Stanley Group in the consolidation. These properties have been very favorably reported on and the ley group has been to a large extent developed by New Zealand capital, The Stanley group has suffered from a serious fiasco. New Zealand capital undertook to instal a dredge under a working agreement with the owners. After the dredge was installed, the New Zealanders discovered that their agent had failed to secure the necessary signatures to the agreement and after unsuccessful attempts to adjust matters, advices from New Zealand are to the effect that the dredging company has gone into liquidation. There has been much criticism of those interested in the ground whose signatures were inadvertantly omitted from the contract and who refused to come to a reasonable understanding after the dredge had been installed. So far as we have been able to learn the equipment was adapted to the ground and the values were satisfactory. Altogether it was a very unfortunate outcome and injured the reputation of owners of ground in Paracale abroad where the complete details of the history of the Stanley were unknown.

Upon the result of present negotiations with Melbourne capital rests the immediate future of the industry in Paracale and so far as all expert report in available the properties being considered are very desirable.

The Philippine Dredge on the Malaguit is maintaining its usual output of over 200 ounces a month and all in all has averaged 50 ounces per week during the last four months. We understand that American capitalists are negotiating for this property and that Australian capital is making inquiries.

The Paracale Consolidated is also negotiating with Australian capital and we were informed recently that everything appears favorable for early activity under an option agreement.

MINDANAO PLACERS.—Messrs. Cole and Hanlon have been testing properties in Northern Mindanao and are expected to return to Manila in a few days. An unconfirmed report is that the owners received a telegram from them to the effect that the values found were satisfactory.

SURVEY OF BENGUET DISTRICT.—Paul E. Fanning, mining engineer of the Division of Mines is making a geological survey of this region.

THE GOLD DEPOSITS OF THE PHILIPPINES.—Mr. H. G. Ferguson of the Division of Mines is the author of an interesting pamphlet covering the history of the industry in the islands in very desirable form.

THE BATAN COAL MINES.—Reports from the mines are to the effect that the new coal bunkers there are nearing completion and the output is increasing.

BENGUET MINERS ASSOCIATION—At a recent meeting it was decided to request the government for the appointment of a warden for that district.

R. C. and W. Company, Birmigham, for the supply of the underframes and other ironwork required for the construction of 219 metre-gauge covered goods wagons.—Messrs. Stableford and Company Limited, Coalville, rolling-stock manufacterers, have executed a large order from the Burma Railways for the supply of duplicate or spare parts for carriages and wagons —Contracts for the supply of 2,000 steel tyres for metre gauge carriage and wagon wheel had been given to Messrs. Steel, Peech and Tozer, Limited, and to Messrs. Cammel, Laird and Company, Limited, London and Sheffield.—Messrs. Pintsch's Patent Lighting Company, Limited, have completed two large orders for the supply of incandescent gaslight fittings for rolling-stock to the Bengal-Nagpur Railway.—Messrs. John Spencer and Sons, Westminster and Newcastle-on-Tyne, have supplied this railway with 2,150 volute and 948 spiral springs for rolling-stock. The Electric Construction Company, Limited, have an order from this line for the supply of electric meter field frames and Messrs. Grice and Son, Limited, for locomotive brass boiler tubes.—The Bengal Coal Company has obtained the contract for the Ceylon railways for 90,000 tons.—The East Indian Railway Company are obtaining from England thirty complete locomotive engine tenders, six-wheeled type with a water capacity of 3,500 gallons each and 140 cwts. of coal. *Railways and Shipping.*

FAR EASTERN ENGINEERING, CONSTRUCTION, FINANCIAL AND COMMERCIAL NEWS

ELECTRIC RAILWAYS, LIGHT POWER, TELEGRAPHS, TELEPHONES, AEROPLANES, ETC.

AEROPLANES FOR CHINA —H. E. Yin Chang, Minister of War has ordered several aeroplanes for the purpose of developing a detachment from the Imperial Bodyguard.

THE SHANGHAI MUTUAL TELEPHONE CO., LTD.—The total available for distribution among the shareholders for the year ended March 31, 1911, was Tls. 89.979.55 disposed of as follows:

To	Shareholders Four Taels per share, 14,540 shares...........	58,160.00
,,	Shareholders. Bonus, One Tael per share..........	14,540.00
,,	Directors' Fees....................	2,400.00
,,	A fund for equalization of dividends.........	10,000.00
,.	Carry forward to next year's account.............................	4,879.55

OVERLAND WIRELESS IN INDIA.—It is announced that wireless experts are undertaking an investigation of conditions in India with a view to installing a gigantic system of overland wireless in India designed to connect all the units of army in India. When completed it will be under the control of the Military authorities, and will operate over an area of 2,000 square miles.

F. M. S. POSTS AND TELEGRAPHS.—The report for the year 1910 shows a total of units carried of 18,328,218 an increase of over 2,000,000; 329,365 telegrams were dispatched and 441,759 received showing increases of 65,930 and 174,615 respectively.

At the end of the year there were 1,556 miles of telegraph and telephone line under the department and 5,135 miles of wire in all in the Federated Malay States of which 3,117 were telephone. This includes 965 miles of telephone wire used by the police but does not include the lines of the railways. The department also operates 242 miles of telegraph line in Johore.

The revenue from all sonrces, for the year amounted to $836,364 an increase of $279,676 over the previous year and the expenditure was $629,950.

THE SHANGHAI ELECTRIC CONSTRUCTION CO.—The result of the operation of the Shanghai electric tramways show a profit of £. 7,584 as for the year ended December 31, 1910 compared with a loss of £. 949 for the previous year. The average fare per passenger for 1909 was ¾d, and for 1910 ⅔d.

Total expenses work out at 4-54d. against 4-31d. and the working profit £10,544, or 1-26d. per car mile, against £4,176, or -50d. per car mile. The expense ratio for 1910, which has lately been further reduced, is 78-2 per cent. against 89.48 per cent. The car miles run amount to 996,368 against 1,979,001, and passengers carried amount to 18,715,215 against 11,772,715. In working out these figures we have compared the 12 months to December 31, 1910, with the figures for the same period in 1909. While the car mileage has been stationary, number of passengers has increased over 50 per cent, but this is mainly due to shorter fare sections and low fares. Each ticket for however short a distance is counted as a passenger.

PEAK TRAMWAYS CO., LTD.—This company declared a dividend of 8% and carried forward $1,833 to next account for the year 1910. The management has arranged to add six extra cars on week days and an addition of six cars sundays to relieve the congestion at certain hours of the day and to popularize the Peak in the evening.

TELEFUNKEN WIRELESS FOR DAVAO.—The Insular Government upon the recommendation of the wireless board has purchased Telefunken equipment for the establishment of a station at the port of Davao. The purchase was made through Messrs. Germann & Co., of Manila.

CULTIVATION AIDED BY ELECTRICITY IN KOREA.—The Ginseng Monopoly Bureau has been experimenting at the Kaisong station in this line of endeavor by utilizing the electrotropism of the plant.

The current passed through the stem by means of wires supported by the covering frames over the fields twice a day, that is, at 2 a. m. and 2 p. m. If the method proves successful, it is expected, the crop will increase by ten per cent. in value.

MANILA ELECTRIC EXTENSION. The extension of the line on Taft Ave. is progressing. When completed it will connect Bagumbayan near the City Hall with Vita Cruz in the southern limits of the city and prove a boon to the residents of a large section included in South Manila. Cars are already running on a portion of Taft Avenue South from Nozaleda.

GENERAL ELECTRIC COMPANY.—The report of the General Electric Company for 1910, just issued, shows a profit for the year of $10,855,692. Cash dividends paid were $5,214,368, and the surplus on Dec. 31, was $23,022,705.

Sales in 1910 amounted to $71,478,558, the largest for any year since the organization of the company. The orders received, $71,182,391, exceeded those received in the year ended Jan. 31, 1907, the largest previous year, by nearly 18 per cent., and were 105 per cent. greater than for the year ended Jan. 31, 1905. The total number of orders and contracts received during the year was 338,272, also a record. Unfilled orders at the end of the year amounted to $15,500,000.

"The outlook for the future is promising," the report says. "The business of lighting and power companies is growing rapidly; electric railway companies are improving their service and extending their lines in keeping with the increasing population. Steam railway companies are electrifying their shops, terminals, and branch lines. The use of motors and other electrical appliances for industrial purposes is extending as their utility and value are more thoroughly understood and demonstrated."

The 5 per cent. debenture bonds of the General Electric Company are convertible into stock at par on and after June 1, 1911, and a circular has just been issued instructing holders desiring to convert bonds into stock to collect the coupon due on June 1 in the usual way and to send the bonds themselves to the Farmers Loan and Trust Company or the American Trust Company, Boston.

The General Electric Company does a large business in the Far East and is allied with a Japanese Company.

Japan's Electric Railway Association.—The Empire Electric Railway Association, the joint organization of the electric railway companies throughout the country, held its semi-annual general meeting recently. Mr. Nakashoji, Vice-Minister of Communications. Mr. Hirai, Vice-President of the Railway Board. Mr. Nakatani, Director of the Electric Bureau, and several other high officials of the railway board were present.

Eastern Extension Telegraph.—The directors of the Eastern Extension Australasia and China Telegraph Company report, for the half-year ended Dec. 31, 1910, that the gross receipts, as shown in the revenue account, amounted during the period to £336,976, against £315,034 for the corresponding half-year of 1909. The working expenses, including £22,607 for maintenance of cables, absorb £154,300, against £143,674 for the corresponding period of 1909, leaving a balance of £182,675. From this is deducted £2,355 for income-tax payable in England, £417 for extraordinary expenses as shown in the revenue account, and £15,084 for interest on debenture stock, leaving as the net profit for the half year £164,854. After adding £72,763 brought forward from the previous half-year, there is an available balance of £237,617. One quarterly interim dividend of 1¼ per cent, has been paid for the half-year, and it is now proposed to distribute another of like amount on thei 7th inst., making, with the interim dividends paid for the first half-year a total dividend of 5 per cent. It is also proposed to pay a bonus of 4s. per share, or 2 per cent., making a total distribution of 7 per cent. for the year 1910. The sum of £75,000 has been transferred to the general reserve fund and the balance of £27,617 carried forward. An agreement has been entered into by the Imperial Chinese Government with the Eastern Extension and Great Northern Telegraph Companies for an advance to the Board of Communications of £500,000, at 5 per cent. interest, on account of the moneys payable by the companies to the Imperial Chinese Telegraph Administration under their existing agreements. The advance has been obtained to enable the Board of Communications to reorganise, improve, and develop the telegraph and telephone services throughout the Chinese Empire. The wireless telegraph installation referred to at the last general meeting as then being in course of erection at the company's Keeling-Cocos station, to enable telegrams to be exchanged between passing ships and that remote place, was opened for public service on March 2, last. The negotiation with the British Government for extending the wireless service to the company's Singapore, Hong Kong, and other stations are still proceeding.

Eastern Telegraph Company.—The report of the directors for the half-year ended Dec. 31, 1910, states that the revenue for the period amounted to £670,147 15s. 5d., from which are deducted £219,231 0s. 9d. for the ordinary expenses, and £45 558 10s. 7d. for expenditure relating to maintenance of cables, sundry differences in exchange, and income tax payable abroad, leaving a balance of £405,358 4s. 1d., to which is added £59,590 7s. 1d. brought from the preceeding account, making a total available balance of £464,948 11s. 2d. After providing for income tax payable in England, interest on mortgage debenture stock, and dividends on the preference stock, which in all absorb £81,186 1s 4d., there remains a balance of £383,762 9s. 10d., out of which the directors have placed £180,000 to the general reserve fund, and have paid an interim dividend of 1¼ per cent. on the ordinary stock, amounting to £50,000. The directors now recommend the declaration of a final dividend on the ordinary stock of 1¼ per cent. and a bonus of 2 per cent., amounting together to £130,000, both payable on May 17, free of income tax, and making, with the three previous payments on account, a total distribution of 7 per cent. for year ended Dec. 31, 1910. It is proposed to carry forward the balance of £23,762 9s. 10d. to next account.

Singapore Electric Tramways.—The report for the year ending Dec. 31, 1910, and the accounts show an excess of revenue over expenditure of £31,013, after charging debenture interest, depreciation, and royalty, being £1,843. Compared with the year 1909, tramway revenue shows an increase of £3,622; there were an increase of 268,332 passengers carried and 14,502 car miles run.

Great Northern Telegraph Company.—Report for 1910 shows an increase in net revenue of £23,400 and dividend 18 per cent.

Western Electric Co.—The last report of the directors cover 13 months instead of the previous one, the end of the year being advanced from November 30 to December 31, as follows:

The sales of the Company for the 13 months ending December 31, 1910, were $68,375,150, as compared with $45,575,138 for the previous year of 12 months, an increase of 38 5% per annum. This increase has been well distributed over the different lines of merchandise and among the various classes of customers.

There have been no such increases in prices during the year as might have been justified by the increased cost of labor and material.

It is our policy to look for increased gross profits in the direction of reduced manufacturing costs and expenses rather than by increases in the selling prices.

For 13 months ending December 31, 1910, the number of orders received in America was 896,000 as compared with 695,000 for 12 months of 1909, an increase of 19% and the value of an order for 1910 was $72.00 as compared with $62.00 for 1909.

During the year the work of concentrating at the Hawthorne plant the manufacturing work formerly carried on at the New York City and Clinton Street, Chicago, Plants has been continued. Additional buildings authorized during 1909 and 1910 and now in use aggregate 235,000 square feet of floor space. The manufacturing plants have been worked to their full capacity during the year. For 1911 additions at Hawthorne have been authorized amounting to about $1,000,000 to provide for further concentration and additional facilities for the business. The condition of the Plant is fully up to the high standard which the Company has maintained in the past.

During the year the Company sold its Clinton Street and Polk Street properties for $3,247,204.09. These properties were carried on the books at $2,759,971.14. The profit $487,232.95 has been carried to Reserves. Pending the erection of buildings now under way at Hawthorne the south half of the Clinton Street property has been rented for a period of 2 years to January 1, 1913.

On January 1, 1911, the number of employees was 23,464 as compared with 17,835 at December 1, 1909.

In 1906 the Board of Directors established a Pension Fund for the benefit of employees retired after 20 or more years of service. There are now 45 ex-employees on the roll and the average pension paid is $713 64 per annum.

The total current assets, including sundry investments, less all liabilities except First Mortage 5% Bonds were at January 1, 1911, $42,659,123, which is more than two and four-fifths times the total bond issue authorized and outstanding of $15,000,000.

To take advantage of the favorable bond market it was deemed wise to sell $6,250,000 First Mortage 5% Bonds held as security for the 5,000,000 2 year 4½% collateral trust notes issued January 1, 1910. The proceeds from these bonds were used to take up these notes on January 1, 1911, and to provide for the future needs of the Company.

PUBLIC WORKS, DOCKS, WHARVES, BUILDINGS ETC.

Philippine Bureau of Public Works.—The expenditure for the fiscal year 1910–11 is estimated at ₱8,800,000 and the total expended during the first half ended December 31, 1910, was ₱4,134,867,12 while on that date there were 88 contracts entered into involving a total expenditure of ₱3,000,000. Road and bridge funds disbursed during the six months amounted to ₱1,890,420 and 129.1 kilometers of first class road completed. The total of roads under maintenance measure 2501 kilometers, an increase of 587 kilometers over the previous term. Of this length 1451 kilometers are under isolated caminero maintenance.

Plans have been prepared for 61 bridges and culverts, for which the total estimated cost is ₱1,553,600, and construction was begun on 22 important structures which will cost, approximately, ₱369,000.00.

Construction has been authorized on 97 barrio school buildings scattered throughout all parts of the archipelago, the estimated cost of which is ₱679,009.

The Consulting Architect has completed plans for 17 buildings in the City of Manila and 22 buildings in the various provinces, for which the total estimated cost is ₱7,540,-900.

The Division of Building Maintenance has expended ₱287,971.16, and has available for expenditure a balance of ₱243,556.57. The Department has under construction 13 important repair and construction jobs.

The San Miguel, Tarlac, irrigation project is the only one under construction at the present. It is hoped that this project will be completed not later than August, 1911.

Plans for the Los Baños project are nearing completion, and it is anticipated that construction upon this will begin in the near future, also on repairs to the existing works on the Friar Lands Estates and construction on the Binday Bridge project.

The important projects under investigation upon which it is hoped to begin work within a reasonable length of time are:

(1) The Ambalangan-Dalin System; (2) Dingras Project-Ilocos Norte; (3) Orion Project Bataan; (4) Polillo Project-Rizal; (5) Santa Barbara Project-Iloilo; (6) San Miguel-Leon Cordova Project-Iloilo.

All of these projects are awaiting contracts with the owners of the land involved and completion of plans and specifications. Reports have been rendered upon 30 irrigation, water supply, and river control projects during the half year closed. These reports cover 43,460 hectares. The most important general survey under way is that covering the flat land north of Manila Bay known as the Pampanga River project. The surveys to date cover about 20,000 hectares of this project. There are now in existence about 50 river gaging stations and data are available covering 30 rivers and streams for a period of one year. The total funds made available for the Irrigation Division by various Acts are ₱2 346-775. The total amount allotted to December 31st is ₱1.891,110.14; balance unallotted ₱455,664.86. The expenditures for the first six months exclusive of general expense charges were ₱290,663.28. The balance cash on hand on December 31st was ₱1,489,193.84.

This Department has operated 7 Deep Well Rigs and 7 Jet Rigs; 13 Deep Wells have been completed of which 9 were successful. The average depth of these wells is 883 feet and the average cost ₱4.70 per foot.

40 Jet Wells have been completed of which 25 were successful. The average depth of these wells is 155 feet and the average cost ₱3.46 per foot.

We now have official records of 566 completed wells, as follows:

Drilled by Bureau	248
Drilled by Provinces	289
Drilled by Military	29
Total	566

In addition to this it is believed that 34 will be a conservative estimate of wells completed of which we have no record, making the grand total in the Islands at the present time, approximately, 600.

Special Projects.—Damages to the Benguet Road from floods and typhoons during the first six months of the fiscal year amounted to about ₱40,000, being much less than the preceding season.

Approximately 10 kilometers of road were resurfaced, many narrow places widened, and some of the dangerous short turns have been straightened.

The total estimated expenditure on this road for the fiscal year for maintenance and for permanent improvements, including two suspension bridges is, approximately, ₱192,-000 as compared with ₱358,585.82 spent the preceding fiscal year.

City of Baguio.—The new City Hall was constructed at a cost of, approximately, ₱40,000. A new dormitory and 23 additional cottages were under construction and ready for occupancy by the time the season opened. The estimated cost of these buildings is ₱160,000.

The new city water supply system is installed and giving satisfaction. Approximately ₱140,000 have been expended in maintenance and construction of roads and bridges within the city limits.

Government Matadero at Mariveles—The Philippine Government is considering plans for the establishment of an isolated matadero near Mariveles for the reception and slaughter of imported cattle. The difficulty experienced in protecting the islands from cattle disease and at the same time make fresh meat available at reasonable prices has been a serious problem and it is expected that present plans will meet the situation.

Tokyo Water Supply—Negotiations are under way between the Tokyo Council and the Yamanashi prefecture authorities to secure a large tract of forest land for the purpose of protecting the sources of the Tama river from which Tokyo secures its supply of water. Otherwise it will be necessary to create a reserve forest for this purpose.

New Cebu Custom House—The three story building under construction will be formarly opened July 4. The construction is of reinforced concrete and cost approximately ₱200,000.

Tokyo Sewer System—Work will soon commence on this extensive system which when completed will cost over 33,000,000 yen in the Asakusa, Kanda and Shitaya district. The work in these districts alone will cost about 6,000,000 yen and is expected completed in 1915. The other sections will be started as soon as feasible.

Anti-Malarial Works in the F. M. S.—The Public Works department spent approximately $46,000 in anti-Malarial works particularly in drainage of swamps and ponds.

F. M. S. Roads—The Director of Public Works recognizes the necessity of providing for the increased speed and weight of vehicles in the construction and maintenance of roads. The width of metalled road is being increased from 12 feet to 15 feet and a maximum of 18 feet, and bridges are being built to meet the increased weights and speed of motors and motor trucks.

The Whangpoo Conservancy.—The report for the quarter ended Mrach 31 shows a total expenditure of Tls. 164,231.35 and a balance available carried forward of Tls. 104,911.

Hongkong's New Theater.—The Victoria Theater with a seating capacity of 800 was opened May 26. This building is so arranged that an unobstructed view of the stage is provided from every seat; the lighting system is extensive and throughout the appointments are adapted to comfort and convenience of theatergoers.

Chinnampo Waterworks.—Work on the projected waterworks which will cost 420,000 yen began early this month.

Macao Harbor Works.—Messrs. Macdonald & Co. of Hongkong have secured the contract for the dredging of the Channel 40 meters wide and 12 feet deep in the harbor and to cost $160,000.

SHIPBUILDING, MERCHANT MARINE AND FISHERIES

Transfer of the S. S. American Maru.—The Osaka Shosen Kaisha has purchased this steamer from the Toyo Kisen Kaisha for the Kobe—Formosan service. The American Maru is of 11,000 tons displacement and was built at Newcastle-on-Tyne thirteen years ago. It is understood that the Toyo Kishen Kaisha had placed an order with the Mitsuibishi yards at Nagasaki for a vessel to take the place of the American Maru which will be ready by August this year.

Steam Traweler for Hongkong.—The steam trawler *Hoi Fung*, 195 tons gross register, built in England for the Hongkong and South China Steam Fisheries Co., Ltd., sailed on April 28th for Hongkong. She is expected to call at Gibraltar, Port Said, Colombo and Singapore, on the voyage out this month.

Japanese Purchase Foreign Steamers.—The steamer Bucenta 3593 tons gross, of the Bucknall line and the Liverpool steamer Ching Wo, 3883 tons gross, have been purchased in England for delivery in the Orient.

Steam Trawelers for Japan.—According to the *Japan Times* there are now 38 steam trawlers in operation off the coast of Japan. Ten trawlers are being built at the Osaka Iron Works and five at other yards and the Oriental Whaling Company has decided to purchase five at a cost of 3000,000 yen. With others to be built or purchased abroad. It is believed that the number of trawlers owned in Japan will rise to eighty next year. It is only three years ago that the first was imported.

Japanese Naval Construction.—The Mitsu Bishi Shipbuilding Yard at Nagasaki is about to engage two thousand workmen in connection with the construction aof 27,000-ton cruiser for the Japanese Navy. The keel of the cruiser will be laid early in 1912, and the vessel is expected to be ready for launching in the Spring of 1915.

Sale of the Wrecked Asia.—The wreck of the P. M. S. Asia, as she lies on Heachu Island, Taichu Group, was sold by auction at the offices of Messrs. Hopkins, Dunn and Co., Shanghai, last month. There was a large attendance of prospective buyers from the Coast ports, Wenchow, Ningpo, Foochow, etc., and competition was keen, bidding starting at Tls. 1,000 and reaching Tls. 8,200 before the vessel was knocked down to a Chinese buyer from Foochow. For the cargo, Tls. 2,800 was realized.

Steamer to be Lengthened at Hongkong Dock.—The Hongkong & Whampao Dock Co., Limited, has secured the contract for the lengthening of the S.S Luis Rafael Yangco owned by the Yangco interests of Manila.

Japanese Naval Construction.—The torpedo-boat destroyer *Yamakaze*, which has been building at the Mitsuhishi Dockyards had her trial trip this month. Tests of separate parts of the ship will be held in July when she will go to Sasebo for her armament. The *Yamakaze*, together with the *Umikaze*, will be attached to the Yokosuka Naval station. The *Umikaze*, which is now under construction at the Maizuru docks, is reported to have proved quite satisfactory after a series of trials. On one trial run, she developed a speed of over 33 knots.

Mitsui Bussan Kaisha Fleet.—The first of four steamers ordered by the Mitsui Russan Kaisha for work in connection with the Miike collieries, the *Kinkasan-naru*, was launched by Sir Baylton, Dixon & Co., last month. The vessel is of the cantileverframed type, and is 393 ft. 6 m. long by 58 ft. 7 in. broad and 29 ft. 7½ in. deep. She has a deadweight carrying capacity of about 8,200 tons. Engines with cylinders 26 in., 42 in. and 70 in. in diameter, by 48 in. stroke, are to be fitted by Messrs. Blair & Co., Limited.

MINES, MINERALS AND THE METAL TRADE, MACHINERY, ETC.

F. M. S. Mining.—According to the report of the Senior Warden, Mr. W. Eye Kenny-the total yield of tin for the year 1910, amounted to 736,898 piculs compared with 818,887 for 1909, a decrease of 81,989 piculs. The price of tin averaged $77.51 for the year and $87.20 at the close of the year. The output of gold was 16,769 ounces valued at $574,686.

The Kuantan Tin Mining Co.—At an extraordinary meeting this company decided to wind up its business, the report for the year showing a dropping off in net profit from $6,787.76 to $3,000 and there being every evidence that the tin bearing ground under lease was exhausted. This company has paid dividends amounting to 125% and on winding up voluntarily there should be a dividend of 35% additional.

Raub Output.—The output of gold for the four weeks ended May 24 amounted to 697 ounces.

American Oil Machinery for Burma.—Two hundred tons of American oil boring machinery has been purchased in America by the Burma Oil Co. of Rangoon. Among the consignment are 100 carloads of iron pipe and 100 tons of wire rope, fifty ordinary boilers, and thirty-five engines, etc. This purchase was made after an investigation of the machinery and methods employed by the California oil companies.

Orsk Gold Mining Co.—This company has taken over a group of claims privately worked by Russians and during the last 3 years have paid expenses of testing the property with the gold taken out during the work. During the Summer of 1909-10 the company operated a steam excavator plant built by the New York Engineering Co., with a capacity of 1000 yds. per day. A barge washing and screenning plant has been added to wash the gravel dug by the excavator and marks another innovation in placer mining.

DUFF DEVELOPMENT.—The gold dredging return (two dredgers only) for the week ending April 29 amounted to 106 ozs., making a total of 1,101 ozs. since Jan. 1, 1911, against 1,380 ozs., for the corresponding period of last year.

MALAYAN TIN DREDGING.—The prospectus of a company to work by bucket dredging is about to be issued. The capital to be offered is 80,000 shares of £1. Mr. H. D. Griffiths, general manager, Tronoh, has reported on the scheme.

PEKIN SYNDICATE.—The total output for the first four months of the year amounts to 171,400 tons, showing an increase of 73,175 tons, while the sales and consumption together equal 183,300 tons, an increase of 46,300 tons, or 33·79 per cent.

DUTCH OIL.—At the extraordinary general meeting of the Koninklyke Petroleum Maatschappy the proposal to increase the capital from fl500,000 to fl100,000,000 was carried unanimously and without discussion, so that in future the capital will be divided into 1,500 preference shares, 28,500 4½ per cent priority shares, and 70,000 ordinary shares each of fl1,000. The director, Mr. Deterding, replied to a question of one of the shareholders that it was the intention to extend the connections with the United States as much as possible. The branch offices of the company are doing a good busines, and have sold already in 1911 60,000 tons benzine at a price 50 per cent higher than could be obtained in Europe.

TRONOH MINES IMPROVEMENT.—Last year showed a very substantial increase in the quantity of tin ore sold, but the price realized was, owing to the higher price ruling for the metal, largely in excess of the average for 1909. It appears that during 1910 2,945 tons of tin ore were sold, as contrasted with 2,158 tons during 1909, and the amount realized was £266,478, being an average of £92.18 per ton of ore as against £80·48 for 1909. From one section of the eastern lead, in ground outside the main lead, which has been thoroughly tested the general manager estimates a profit of over £130.000. After payment of dividends, amounting altogether to 7s. per share the available balance of profit was £32,902. The directors have decided to write off property account £12,919, carrying forward to this year the balance of £20,983.

THE SIBERIAN SYNDICATE LTD.—At the annual meeting of this company special reference was made to an expert report on the Atbasar Copper Fields in which the syndicate has large interests, to the effect that the prospecting developed about 20,000 tons of 12% copper ore.

THE AMUR GOLD INDUSTRY.—Reviewing the situation the *Mining Journal* says:

The area of the 560 gold placers in this eastern part of Siberia makes about 158,000 acres, of which 208 placers, occupying 58,000 acres, are being worked now. The total quantity of gold sand washed is 310,000 tons, and the result in pure gold was 159,229 ozs. with an average content of about half-an-ounce per ton of sand. In the neighbouring province of Yakutsk seventeen placers are being worked, and 300 tons of auriferous sand washed, yielding 44 000 ozs., average content 146 ozs. per ton of sand. The production in the Amur province has been registered since 1868 by the Government, and from the year up till November 1, 1910, the total production according to official sources has been about 7,000,000 ozs. This figure cannot be called exact for much of the gold escapes registration amounting to no less than 70 to 90 per cent. of the annual quantity officially declared. Of recent years small gold industries have grown up on the ground, which, with the introduction of the free circulation of gold on March 1, 1902, have grown considerably. Last year gold poaching was particularly rife, as many as 1,5000 thieves having appeared on the River Pimpon on the Upper Amur Gold Company's placers, and removed about 35,000 ozs. of gold from the sands, and these robbers were only shifted with the assistance of a posse of soldiers from Blagoveshchensk.

SIAMESE SECRET OF BRONZE CASTING IN SIAM.—Vice Consul General Carl C. Hansen of Bangkok gives the following formula discovered by Major Cerini in an old Siamese manuscript belonging to the late King as translated by that officer with his comment:

"Take 22 ticals (1 tical equal to one-half ounce avoirdupois) weight of pure tin, melt it at a slow fire, avoiding bringing it to red heat. Pour 2 ticals' weight of quicksilver, stir until the latter has become thoroughly absorbed and amalgamated; then cast the mixure in a mold, forming it into a bar. Take one catty in weight (80 ticals) of refined copper and melt it. Then gradually incorporate with it the amalgam, keeping in the meantime the fused mass well stirred.

"When this has been done, throw into the crucible a sufficient quantity of ashes obtained from the stem of the bua-bok (terrestrial rotus) creeper, so as to cover the molten metal. Remove the dross with an iron ladle;

FINANCIAL, COMMERCIAL AND MISCELLANEOUS.

HAWAIIAN SUGAR CROP.—The report of one sugar company estimates its crop for 1911 at 50,000 tons as against 56,865 in 1910. In 1910 dividends amounting to $1,600,000 were declared and $661,000 carried to surplus account by this company.

PHILIPPINE SOAP CO.—A company has been organized in Manila with a capital of ₱100,000 for the purpose of manufacturing all kinds of soap. Thomas J. Wolff is president, L. F. Goodale, secretary, and J. Williamson, treasurer.

CHANGCHUN BRANCH OF THE HONGKONG & SHANGHAI BANK.—The bank has decided to establish a branch at Changchun, the terminal of the Changchun-Kirin Railway.

THE NETHERLANDS TRADING CO.—This company has declared a dividend of 9%.

THE TA-CHING BANK.—At a General meeting of this institution the report submitted places the profits for the year of its forty agencies at Tls. 1,489,716 of which 487,716 is carried forward to surplus account, Tls. 200,300 to legal reserve; Tls. 80,120 is set aside for office expenses; Tls. 160,240 paid as bonus to employees; small percentages were paid as "rice money" to the Board of Finance; a 6% bonus to the officials and 1½% to the clerks, leaving a balance of Tls. 560,840 to be paid the shareholders as final dividend making a total for the year of 13%.

THE UNIVERSITY OF THE PHILIPPINES—The entrance examinations were held the latter part of May and registration in following departments were announced as follows: College of Liberal Arts. College of Medicine and Survery, College of Veterinary Science, College of Engineering, School of Fine Arts and Course in Pharmacy, June 1-3; the College of Agriculture to open June 12 and the College of Law, July 3.

THE HIGLANDS AND LOWLANDS RUBBER CO.—This company has paid a final dividend of 20% making 50% for the year.

SUGAR CENTRAL IN NEGROS.—Iloilo and Honolulu capitalists are interested in the establishment of a sugar central in San Carlos, Negros, that will represent an investment of ₱2,000,000.

PHILIPPINE HEMP.—The 1911 crop is estimated will reach 1,400,000 bales as against 1,340,000 in 1910 and 1,280,000 in 1909.

A. S. WATSON & CO.—A. S. Watson and Co., propose to pay a dividend of 3 per cent. for 1910, to write off 25,000 and to carry forward $56,129. The net profits, for the year totalled $33.

THE CHINA MUTUAL LIFE INSURANCE CO. The report for the year shows a total of revenue from interest and dividends of Tls. 447,359.73 an increase of Tls. 71,991.21. The insurance fund amounted to Tls. 7,140,037, an increase of Tls. 977,428 A total of Tls. 971,563 was paid to policy holders during the year for claims, matured endowments, bonuses surrenders and annuities. The insurance fund as it now stands represents Tls. 240 for every Tls. 1,000 of insurance in force.

THE SHANGHAI LIFE.—Business accepted and policies issued for the year amounted to Tls. 3,844,517 an increase of 15% and the total insurance force is Tls. 8,456,986. Revenue from premiums amounted to Tls. 761,216 and from interest, etc., Tls. 76,113 an incease of 34% and the total assets amount to Tls. 1,157,649 an increase of 40% The insurance fund reached Tls. 1,038,835 an increase of 44%.

THE CATHAY TRUST.—The first annual report of the Directors of the Cathay Trust Lt. states that the profit amounts to Tls. 839,703.76. This it is proposed to appropriate as follows:—Directors' fees Tls. 7 000; Auditors' fees Tls. 1,500; writing off preliminary expenses Tls. 6,022.83; to pay a dividend of six per cent on the preference shares equivalent to Tls. 0.45 per share, Tls. 135.000; to pay a dividend of ten per cent and a bonus of fifty per cent on the ordinary shares, equivalent to Tls. 0.50 per share, Tls. 150,000; to place to equalization of dividends account Tls. 400,000; and to carry forward to next year the balance amounting to Tls. 140,130.93.

LONDON METAL MARKET

MAY 15, 1911.

	£ s. d.		£ s. d.
COPPER.			
Tough cake and ingot	57 0 0	..	57 10 0
Best selected	57 10 0	..	58 0 0
Electr olytic	57 10 0	..	58 0 0
Sheets and sheathing	69 0 0	..	—
Flat bottoms	72 0 0	..	—
STANDARD †Cash.	53 3 9	..	—
STANDARD †Three months..	54 0 0	..	—
Copper tubes, seamless per lb..	0 0 8¼	..	—
Lake	58 10 0	..	59 0 0
* Less 3½ per cent.	† Net.		
ALLOYS.			
BRASS: Wire	0 0 6⅝	..	—
,, Tubes (solid drawn)	0 0 6⅝	..	—
,, Sheets	0 0 6⅞	..	—
TIN.			
English ingots, f. o. b.	195 0 0	..	196 0 0
,, bars	196 0 0	..	197 0 0
,, refined	197 0 0	..	198 0 0
Straits... Cash	196 10 0	..	—
Straits... Three months	189 5 0	..	—
Australian spot	—	..	—
Banka (in Holland) Cash	196 5 0	..	—
Banka (in Holland) Three months	—	..	—
LEAD.			
Spanish or soft foreign	12 18 9	..	13 0 0
English pig, common	13 1 3	..	13 3 9
,, L. B.	13 10 6	..	—
,, sheet and bar lead ..	14 12 0	..	—
,, pipe	15 2 6	..	—
,, red	15 12 6	..	—
,, white	18 15 0	..	—
,, patent shot	16 0 0	..	—
SPELTER.			
Silesian ordinary brands	24 5 0	..	24 7 6
,, special brands	24 10 0	..	24 12 6
Sheet zinc	28 10 0	..	—
ANTIMONY.			
Antimony	33 0 0	..	34 0 0
,, Crude	—	..	—
,, Ore (basis 50%)	—	..	—
QUICKSILVER.			
Flasks. 75 lbs. warrants	9 0 0	..	—
ALUMINIUM.	Per ton.		Per ton.
98-99 per cent	62 0 0	..	65 0 0
NICKEL.	Per ton.		Per ton.
98-99 per cent. guaranteed	167 10 0	..	171 0 0

PLATINUM.

Per oz. Troy, 166s. 6d.; nominal and subject to negotiation.

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* Mining Journal.

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International Banking Corp.
Banco Español Filipino
Russo-Chinese Bank

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Jardine Matheson & Co.

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CIGAR AND CIGARETTE MANUFACTURERS
Alhambra Cigar & Cigarette Factory.
Cia. Gral. de Tabacos de Filipinas
Germinal Cigar Factory
Olsen & Co.. Walter E.
La Prueba

CIVIL ENGINEERS
Eastern Eng. Co.
C. G. Young

COAL DEALERS
Western Valleys Anthracite Co.
Chinese Engineering and Mining Co., Ltd.
The Mitsui Bussan Kaisha
South Manchuria Railway Co.
The Han-Yeh-Ping Iron & Coal Co. Ltd.

COFFEE DEALERS (WHOLESALE)
M. A. Clarke (Mayon)

CONTRACTORS, (GENERAL)
Bohler Bros. & Co.
Frank L. Strong
Gordon & Co.
White& Co. Inc., J. G

CONTRACTORS, ELECTRICAL
Arnhold, Karberg & Co.
Germann & Co. Ltd.
H Berry & Co., Ltd.
Shewan Tomes & Co.
Frank L. Strong
Siemens China Electric Engineering Co.

CONSULTING ENGINEERS
White & Co., Inc. J. G.
C. G. Young

DIVING APPARATUS
A. J. Morse & Son

DREDGERS
Middleton & Co., Ltd.
Melchers & Co.
New York Engineering Co.
Priestman Bros. Ltd.
Rose, Downs & Thompson, Ltd.

DRILLING MACHINES
The Keystone's Driller Co.

DRY CELLS
F. H. Thompson.

DRY GOODS, WHOLESALE
The H. B. Claflin Co.

ELECTRIC LIGHTING PLANTS
Anderson Meyer & Co.
Arnhold, Karberg & Co.
Boulton & Paul Ltd.
Fearon, Daniel & Co.
General Electric Co.
Siemens China Electric Eng. Co.
Shewan, Tomes & Co.
Western Electric Co.

ELECTRICAL SUPPLIES
Allis-Chalmers Co.
American Trading Co.
Anderson Meyer & Co.
Arnhold Karberg & Co.
H. Berry & Co., Ltd.
Jardine, Matheson & Co.
Babcock & Wilcox (D. W. Bell)
Belliss & Morcom (D. W. Bell)
Electrical Supply Co. Inc.
Fearon, Daniel & Co.
General Electric Co.
Melchers & Co.
Shewan, Tomes & Co.
Siemens China Electric Eng. Co.
Western Electric Co.

ENGINES (PUMPING)
Allis-Chalmers Co.
Belliss & Morcom (D. W. Bell)

EXCAVATORS AND ELEVATOR
Priestman Bros. Ltd.
Rose, Downs & Thompson, Ltd.

EXPLOSIVES
Jardine Matheson & Co.
Arnhold Karberg Co.
Rendrock Powder Co.

FIBRE MACHINERY
Dailey, C. E.

FOOD PRODUCTS
Anderson & Co., W. H.
Swift & Co.

GAS. ENGINES
Fairbanks, Morse & Co.
Castle Bros.-Wolf & Sons
Detroit Engine Works
Shanghai Gas Co., Ltd.
Melchers & Co.

HOTELS
Astor House Hotel Co.

ICE MACHINERY
Vulcan Iron Works
Melchers & Co

INSURANCE
Stevenson & Co., Ltd., W. F.

JOURNALS, SCIENCE
The Philippine Journal of Science

LIFE INSURANCE
China Mutual Life Insurance Co., Ltd.

LOCKS
Yale & Towne Mfg. Co.

LITHOGRAPHERS
The Wen Ming Press.

LUMBER DEALERS
Cadwallader-Gibson Lumber Co.
Robert Dollar Co.
Export and Import Lumber Co.
Jardine, Matheson & Co.
Port Banga Lumber Co.

MACHINERY MERCHANTS
Anderson, Meyer & Co.
Arnhold Karberg & Co.
Shanghai Machine Co.
Fearon, Daniel & Co.
Frank L. Strong
Stuart S. Harvey
Schuchardt & Schutte.
Samuel & Co., Ltd.

MILL MACHINERY
Rose, Downs & Thompson Ltd.
Niles, Bement, Pond Co.

MINING MACHINERY
Allis-Chalmers Co.
American Trading Co.
Melchers & Co.
New York Engineering Co.
Shewan, Tomes & Co.

MINING COMPANIES
Chinese Engineering & Mining Co.
South Manchuria Railway Co.
Mitsui Bussan Kaisha

MOTORS
The China General Engineering Co.
The Gray Motor Co.
The Remington Oil Engine Co.

MOTOR LAUNCHES
Michigan Steel Boat Co.
Riley Hargreaves & Co., Ltd.
Island Boat Works Co.

OFFICE FURNITURE
Cadwallader-Gibson Lumber Co.

PAINTS OILS AND VARNISH
Standard Oil
Adam Cook's Sons
F. A. Vanderloo & Co.

PULLEYS (STEEL)
Schuchardt & Schütte

PUMPS
H. Berry & Co., Ltd.
The Goulds Manufacturing Co.
Shewan, Tomes & Co.
International Steam Pump Co.
Jardine Matheson & Co.
Shanghai Machine Co.

RAILROADS
Imperial Chinese Railways
Manila Railroad Co.
South Manchuria
Southern Pacific Co.

RAILROAD SUPPLIES
Ackley Brake Co.
American Trading Co.
American Locomotive Co.
Anderson, Meyer & Co.
Arnhold Karberg & Co.
Baldwin Locomotive Works.
Fearon, Daniel & Co.
Henschel & Sohn.
P. Herbrand & Co.
Jardine, Matheson & Co., Ltd.
Melchers & Co.
Mitsui Bussan Kaisha
Westinghouse Brake Co. Ltd.
Shewan Tomes & Co.
Shanghai Machine Co.
Tyer & Co.

REINFORCED CONCRETE CONSTRUCTION
Trussed Concrete Steel Co.

ROOFING PAPER
Malthoid

ROPE MANUFACTURERS
Hongkong Rope Mfg. Co. Ltd.
Santa Mesa Rope Works.
Ynchausti & Co.

SANITARY ENGINEERING
Gordon & Co.

SAW MILLS
Insular Lumber Co.
Jardine, Matheson & Co.
Cadwallader-Gibson Lumber Co.
Port Banga Lumber Co.

SERUM
Bureau of Science

SHIP-CHANDLERY
Ynchausti & Co.
Bazar Siglo XX.

SHIPPING AGENTS
CastlesBros.-Wolf & Sons
Cia. General de Tabacos
Shewan, Tomes & Co.
Stevenson & Co., Ltd.

SHIPBUILDING AND REPAIRS
El Varadero de Manila.
Tsingtauer Werft
Hongkong & Whampoa Dock Co., Ltd.
The Kawasaki Dockyard Co. Ltd.
Kiangnan Dock and Engineering Co., Ltd.
Mitsu Bishi Dock and Engineering Works
New Engineering and Shipbuilding Works, Ltd.
Shanghai Dock and Engineering Co., Ltd.
The Taikoo Dockyard and Engineering Company of Hongkong, Limited
Vulcan Iron Works, Ltd.
William Cramp & Sons.

STEAMSHIP COMPANIES
American Asiatic S. S. Co.
China and Manila S. S. Co., Ltd.
Cia. General de Tabacos
Nippon Yusen Kaisha
Occidental and Oriental S. S. Co.
Pacific Mail S. S. Co.
Transatlantica S. S. Co.
Ynchausti & Co.

STEEL MANUFACTURERS
United States Steel Products Export Co.
Zimmerman Steel Co.

STEEL WORKS
Bohler Bros. & Co.
The Han-Yeh-Ping Iron and Coal Co. Ltd.
Hanyang Iron & Steel Works.
Riter-Conley Manf'g Co.

STRUCTURAL STEEL
American Bridge Co.
Bohler Bros. & Co.
Riter-Conley Manf'g Co.

SUGAR MACHINERY
Honolulu Iron Works.

TANKS
Pacific Tank and Pipe Co.
Shanghai Dock & Engineering Co., Ltd.

TELEPHONES
The Western Electric Co.

TILES AND BRICKS
C. Fressel & Co.
Green Island Cement Co., Ltd.
Chinese Eng. Mining Co.

TOBACCO DEALERS
British American Tobacco Co., Ltd
Cia. General de Tabacos
Olsen & Co., Walter E.

TOOLS
American Tool Works Co.
Lodge & Shipley Machine Tool Co.
Shanghai Machine Co.
Easterbrook Allcard & Co., Ltd.
The Selson Engineering Co. Ltd.

TYPEWRITERS
Remington Typewriter Co.

WINDMILLS
Fairbanks, Morse & Co.
Defiance Machine Works.

WOOD WORKING MACHINERY
American Tool Works Co.
Defiance Machine Works.
Lodge & Shipley Machine Tool Co.